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A

MANUAL OF

VENEREAL DISEASES.

BY

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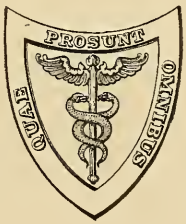
With Fifty-four Illustrations.



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PREFACE.

In this, the second edition of this little volume, which like its predecessor is designated for the use of students as well as practitioners, the author has endeavored to give, in a clear and compact form, a practical working knowledge of the three Venereal Diseases, Gonorrhœa, Chancroid and Syphilis, together with their complications and sequelæ. The history and statistics of these diseases have been purposely omitted, as not belonging to an epitome such as this book is intended to be. A new chapter on the care and use of urethral instruments has been added, as have also many new illustrations. The text has been thoroughly revised, thus bringing the subjects up to date. It is hoped that the value of the book will be enhanced, and that in its new edition it may more fully merit the very kind reception accorded to the original issue.

JAMES R. HAYDEN.

107 WEST 55TH STREET, NEW YORK,
September, 1898.

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PART I.

GONORRHŒA AND ITS COMPLICATIONS.

CHAPTER I.

INTRODUCTION.

Gonorrhœa, also called urethritis, blennorrhœa, blennorrhagia and clap, is an infectious, virulent and suppurative process, attacking most frequently the mucous membrane of the urethra and the structures in anatomical relation with it. The mucous membrane of the mouth, the eye, the anus and the rectum may also be the seat of the blennorrhagic process, either as a result of accident, or of unnatural practices between persons of the same or the opposite sex.

It is the most common and most venereal of all of the venereal diseases, and occurs with the greatest frequency between the twentieth and thirtieth years.

Throughout the following pages gonorrhœa and urethritis will be used as synonymous terms.

DIAGNOSIS.

The diagnosis of acute gonorrhœa or urethritis is, as a rule, readily made from the purulent urethral discharge, the redness and swelling of the meatus, painful urination, and the period of incubation.

There are cases, however, in which it must be differ-

entiated from balanitis, balano-posthitis, chancre of the meatus or urethra, and chancroids of the meatus.

In balanitis or balano-posthitis, if the prepuce be retracted far enough to expose the meatus, the parts can then be carefully wiped off and examined, and a correct diagnosis made, as the pus will be seen to exude, either from the meatus or from between the prepuce and glans.

Chancre of the meatus or within the urethra gives rise to a slight mucous or muco-purulent discharge, with induration of the sore and inguinal lymphatic glands. Endoscopic examination will reveal the lesion if it be situated in the urethra.

Chancroids of the meatus cause a purulent discharge, which is rusty-brown in color and auto-inoculable. They may cause some inflammatory thickening of the surrounding tissues, but never true induration.

PROGNOSIS.

The prognosis of gonorrhœa or urethritis is, as a rule good, provided the patient is otherwise healthy and willing to carry out minutely all of the details of treatment, until he is pronounced cured by his physician. There are cases of course, in which serious and sometimes even fatal complications occur, such as gonorrhœal rheumatism, pericarditis, endocarditis, peritonitis, pyæmia and lesions of the cord; so that we must always remember, and inform our patients, that gonorrhœa is at best a very grave and far-reaching disorder, and that treatment should not be relaxed until the urethra, and the structures in anatomical relation with it, have returned to their normal conditions.

Provided everything goes smoothly, we can usually promise a cure in from four to eight weeks.

INFECTION.

Gonorrhœal infection may be either direct or mediate.

Direct infection is the transferrence of gonorrhœal pus from the genitals of one person to those of another during coitus. This is the usual and most common mode of infection, although it may also result from unnatural practices (gonorrhœa of the anus, rectum and mouth).

Mediate infection may and does sometimes occur, as when instruments, syringes, towels, dressings or the fingers have been contaminated with gonorrhœal pus and then brought in contact with the meatus or urethral mucous membrane.

ETIOLOGY.

In spite of the vast amount of scientific and valuable work done in this field since the discovery of the gonococcus by Neisser, in 1879, the etiology of gonorrhœa is not as yet an absolutely settled and fixed question, and the physician should therefore exercise the greatest care and precaution before giving his positive opinion as to its origin, for on his decision may rest the honor of wife or husband.

Although the vast majority of cases of gonorrhœa are due to the gonococcus Neisser, yet there are some in which this pathogenic agent cannot be found, and we must therefore attribute the disease to other micro-organisms (staphylococci and streptococci). Clinically,

these cases are sometimes just as severe and have as many complications as those in which the gonococcus is found.

Men may contract gonorrhœa from women either during or immediately after the menstrual epoch. These cases are usually severe in character, and may be accompanied by any of the various complications.

It is also possible for a man to contract gonorrhœa from the secretions of the uterus, a lacerated cervix and perineum, and vulvo-vaginal secretions due to uncleanliness.

All of the foregoing facts have been demonstrated by the most competent observers, both clinically and microscopically, and should therefore be given due thought and consideration, before giving an absolute and positive opinion as to the etiology of every case of gonorrhœa.

THE GONOCOCCUS.

The gonococcus, Neisser, is a diplococcus, measuring from 0.8 to 1.6 micromillimeters in length, and from 0.6 to 0.8 micromillimeter in breadth. The gonococci are arranged in pairs, each half of the diplococcus being kidney-shaped in appearance, with their flat or inner borders in apposition, which gives the entire coccus the appearance of a coffee-bean. They grow and multiply very rapidly, each pair splitting into four by means of a cleavage at right angles to the median fissure.

The gonococci are always grouped in twos, fours, eights, etc., and never arranged in chains; they are found within the pus-cells, upon the epithelial cells, and among and between these cells.

Staining. The entire glans penis and preputial cavity should be thoroughly cleansed, and the pus at the

meatus squeezed out, and wiped off with sterile gauze. A sterilized platinum loop is then passed into the urethra to obtain the secretion for examination; this is spread in a thin film on a clean glass slide, allowed to dry in the air, and then passed through the flame of an alcohol lamp two or three times, being careful to have the pus side turned up. A drop of a dilute watery solution of methyl-blue is then applied with a glass rod, and left on for from two to three minutes, when it is washed off with distilled water. The specimen can now be examined in water, or carefully dried, mounted in Canada balsam, and studied with a high-power oil-immersion lens. For other methods of staining, and for culture, and inoculation experiments with the gonococcus, the reader is referred to more exhaustive works on the subject.

Progress of the gonococcus. The gonococci, having been deposited on the superficial epithelial layer of the urethra, increase rapidly in numbers, and give rise to a scant serous discharge, which appears at the meatus, and which consists of serum and epithelial cells, upon and between which are seen gonococci in varying numbers. At the end of a few hours, or a day or so, the gonococci penetrate the cement-substance between the epithelial cells and pass downward toward the subepithelial connective-tissue layer; this stage of the invasion being marked by the onset of a purulent discharge which destroys and throws off the urethral epithelium, thus giving free access to further gonococcus invasion. The purulent discharge is made up of pus-cells and serum. the gonococci being found principally in the pus-cells, although some free groups may be seen.

CHAPTER II.

ACUTE GONORRHŒA, OR URETHRITIS.

ACUTE gonorrhœa, or urethritis, is spoken of as being either *anterior* or *posterior*, according to the portion of the urethra involved by the inflammatory process.

If the disease be situated in the *anterior urethra*—that is, between the meatus urinarius and the anterior layer of the triangular ligament—it is called *anterior* gonorrhœa, or urethritis; but, if in the *posterior urethra*, which includes that portion of the canal situated between the anterior layer of the triangular ligament and the bladder (membranous and prostatic urethræ), it is called *posterior* gonorrhœa, or urethritis.

When the *entire length* of the urethra is involved, which is usually the case, we speak of it as an *antero-posterior* gonorrhœa, or urethritis, and if the disease has extended into the *bladder*, as a *urethro-cystitis*.

SYMPTOMS OF ACUTE ANTERIOR GONORRHŒA, OR URETHRITIS.

After a period of incubation varying in the majority of cases from two to seven days the symptoms of acute anterior gonorrhœa, or urethritis, make themselves manifest, although in some subjects they may be delayed for ten, fourteen or twenty days, but such long periods of incubation are, as a rule, rare. For clinical purposes the course of the disease is best divided into

three stages, as follows: the prodromal stage, the acute stage and the stage of decline.

Prodromal stage. This stage is marked by prickling or tickling sensations in or in the region of the meatus, which becomes reddened, slightly swollen and glued together, or filled with a grayish-white secretion. Sometimes decided pain is felt in the glans, but in other cases pain is only experienced during and after urination. This local irritation of the fossa navicularis causes in some individuals a very marked increase in sexual desire, which, if indulged in at this time, greatly aggravates the already existing inflammation.

At the end of the second or third day all of the above symptoms are more marked. The meatus is pouting in appearance and surrounded by an area of redness, the secretion is increased in amount and assumes a decidedly purulent character, the pain is sharper and during urination gives rise to a decided burning sensation in the urethra, which is spoken of as ardor urinæ; this may be continuous, or only felt during and after the act.

Acute stage. In this stage, which usually begins at about the end of the first week, the discharge is profuse, greenish-yellow in color, creamy in consistence, and sometimes tinged with blood; the lips of the meatus and entire glans penis are bright red in color, hot and swollen; the œdema extends from the lower angle of the meatus into the frænum, and thence into the prepuce, in this way being liable to produce either a phimosis or paraphimosis, according to the conformation of the parts. The lymphatics on the dorsum of the penis may become swollen and painful, and as they communi-

cate with the ganglia in the groins may cause them to become enlarged and tender. As the gonorrhœal process extends down the urethra, it sometimes causes an inflammation of one or more of the periurethral follicles, which can be felt beneath the skin as small, shot-like bodies. In severe cases the corpus spongiosum becomes hard and painful, and if this condition extends to the bulbous portion, patients experience great pain in siting down, as pressure is then brought directly on this swollen and inflamed mass of erectile tissue. Every act of urination is now accompanied by intense suffering as the acid urine forces its way through the urethra, whose calibre has been greatly lessened by the œdema of its mucous membrane. The stream assumes various shapes and sizes, and in severe cases comes only in drops, or we may have complete retention, from compressor spasm, and swelling of the mucous membrane.

Chordee and painful erections now come on, especially at night, which rob the patient of his rest, and in this way cause debility and general malaise from loss of sleep. True chordee is due to infiltration of the meshes of the corpus spongiosum, with inflammatory material, which prevents its full extension when the corpora cavernosa become erect, thus causing the penis to curve down. It is a rare complication of acute gonorrhœa, as compared to painful erections, which occur in almost every case.

Declining stage. This stage usually begins at about the end of the second or beginning of the third week, and is marked by a general improvement in the patient's condition. Urination becomes less painful, the erections at night disappear, as do also the swelling and

soreness along the corpus spongiosum. The meatus and glans penis begin to assume their normal appearance, and the discharge becomes muco-purulent, thinner and sticky in character, until it is so slight in amount as to cause only a gluing of the lips of the meatus in the morning, from which, when separated, a few drops of secretion may be pressed.

Relapses are common at this time, as the patient, thinking himself about cured, is apt to indulge in over-exercise, alcoholics or venery, which indulgence is rapidly followed by a return of all of the acute inflammatory symptoms above described.

If in acute anterior gonorrhœa, or urethritis, the patient passes the first half of his urine in one glass cylinder, and the second half in another cylinder, the urine voided in the *first* cylinder will be cloudy from the pus washed out of the anterior urethra, while that passed in the *second* cylinder will be perfectly transparent, as it consists of clear urine from the bladder passed over a now clean urethra.

This test, which is known as Thompson's two-glass test, is of great value in differentiating acute anterior from acute posterior gonorrhœa, or urethritis, and for its proper performance the patient should have a considerable amount of urine in the bladder and pass an equal amount in each glass; it is of little value, however, in differentiating chronic anterior, from chronic posterior gonorrhœa, or urethritis.

As the opacity in a given urine is not always due to the presence of pus (pyuria), the following table of the late Professor Ultzmann is inserted, which renders this subject clear in a very concise manner. By gradually

heating the upper half of the urine (in a test tube) to boiling, the opacity—

Vanishes	Increases			Remains unchanged even after addition of acetic acid.
If due to *acid urates*	If due to *earthy phosphates, carbonates,* or *pus-corpuscles.* Add one or two drops of acetic acid.			The dimming is caused by *catarrhal secretion,* or by *bacteria.*
	Dimness vanishes with evolution of gas. *Carbonates.*	Dimness vanishes without evolution of gas. *Phosphates.*	Dimness remains unchanged *Pus.*	

CHAPTER III.

ACUTE POSTERIOR GONORRHŒA OR URETHRITIS.

When the gonorrhœal process passes beyond the anterior layer of the triangular ligament and involves the posterior urethra we speak of it as *posterior* gonorrhœa, or urethritis, either acute, sub-acute or chronic. In from eighty to ninety per cent. of all cases of acute anterior gonorrhœa the disease passes rapidly down the urethra to the bulb, and thence into the posterior portion, so that posterior urethritis, instead of being a complication, as was formerly thought, is in reality the usual course of the disease.

SYMPTOMS OF ACUTE POSTERIOR GONORRHŒA, OR URETHRITIS.

The typical symptoms of acute posterior gonorrhœa, or urethritis, are as follows: A sudden and very marked decrease in the amount of discharge at the meatus, accompanied by an increased frequency in urination, with inability to hold the urine when the desire comes on, and which is followed by vesical tenesmus, and in severe cases by blood, which comes from the congested vessels of the prostatic urethra, which are ruptured by the spasmodic contractions of the prostatic muscular fibers at the close of urination.

The pus from the posterior urethra passes upward into the bladder, thus rendering all the urine uniformly cloudy; so that if these patients urinate in two glasses

(Thompson's test) both glasses will be cloudy, the *first* a trifle more so than the *second*, as it consists of turbid urine from the bladder, plus the urethral secretion which it washes out.

In some cases the patient has to urinate every few minutes, each act being followed by a few drops of blood and intense pain in the glans penis, prostate and rectum; in others there is temporary incontinence of urine, due to the extreme irritability of the prostatic mucous membrane, which, when the patient goes to sleep at night, causes painful pollutions that are sometimes blood-stained. Retention of urine may occur at any time from spasm of the compressor urethræ muscle, brought on by the intense local irritation; therefore the physician should always be prepared for this complication.

Vesical tenesmus, if severe, is accompanied by a temporary albuminuria, which disappears as the tenesmus subsides.

The above symptoms vary greatly in different individuals, being very marked in some and mild in others. The duration of the attack depends largely on the treatment, and the habits of the patient, lasting anywhere from a few days to several weeks.

If in these cases of acute posterior gonorrhœa, or urethritis, the prostate gland is examined by the finger, per rectum, it will usually be found enlarged (congested), hot, throbbing and exquisitely tender; occasionally one or both seminal vesicles are involved, but this is a very rare complication in comparison with prostatitis, as has been clearly demonstrated by a vast number of careful and personally conducted examinations made during the acute stage.

CHAPTER IV.

TREATMENT OF ACUTE ANTERIOR GONORRHŒA, OR URETHRITIS.

ABORTIVE TREATMENT.

The abortive treatment of acute anterior gonorrhœa or urethritis should only be employed during the first day or so of the disease, while the discharge is still mucoid in character, and shows under the microscope only epithelial cells and gonococci, but no pus-cells, as in this stage the gonococci are situated upon the epithelium of the urethra, and are therefore in a position to be destroyed by local applications.

Unfortunately, patients do not present themselves, as a rule, until the discharge has become purulent in character, when it is then, as a general rule, too late to try any form of abortive treatment, as by that time the gonococci have penetrated the epithelial layer of the urethral mucous membrane, and are therefore beyond our reach.

If the abortive treatment has been decided on, the patient should always be informed that it is painful, apt to fail, and may lead to such complications as peri-urethral abscess, posterior urethritis, epididymitis, prostatitis and cystitis. The steps in the procedure are as follows: the patient first urinates, in order to flush out any secretion that may have accumulated in the urethra; then a thoroughly clean No. 12 French soft-

rubber catheter sparingly lubricated with glycerin is passed into the urethra for about four inches; through this catheter the anterior portion of the canal is irrigated with a hot boric-acid solution, thrown in gently and slowly by means of an Ultzmann hand-syringe, the solution running from behind forward and escaping at the meatus. The patient then lies down and a Weir's meatoscope (See Fig. 1) is passed into the urethra, the

FIG. 1.

Weir's meatoscope.

obturator removed, and a cotton applicator dipped in silver-nitrate solution of fifteen grains to the ounce is applied to the urethral walls as the meatoscope is slowly and gently withdrawn. In this manner the whole fossa navicularis, which is the seat of the disease at this period, is thoroughly medicated with the silver solution, and the gonococci are destroyed.

This application is usually followed in a few hours by painful urination, a profuse purulent urethral discharge, sometimes blood-stained, which, if the treatment be successful, subsides in a few days, leaving the patient with a slight muco-purulent discharge, which is readily controlled by a simple astringent hand-injection.

The patient in the meantime is kept in bed, on a milk-diet, with cold lead and opium wash around the penis, and given an alkaline mixture internally. The bowels should be moved freely every day by means of

cathartic pills, and the patient allowed to drink liberally of the alkaline mineral waters.

The Janet method of treating acute gonorrhœa is much in vogue at the present time, its advocates claiming that it will abort the disease in its incipient stage, and cut short the period of acute suppuration if employed at a later date. Ten or twelve treatments are said to be sufficient to accomplish a cure. Warm solutions of permanganate of potash are used for the irrigations, and vary in strength from 1–1000 to 1–4000, and even up to 1–500 during the declining stage. Janet uses an irrigator, with several feet of rubber tubing, to which is attached a conical glass nozzle; a stopcock on the tubing controls the flow of the fluid. The patient having urinated, lies on his back, and the glass nozzle is gently inserted into the meatus, and the fluid turned on; the irrigator being raised two feet above the level of the patient, if the anterior urethra alone is to be treated, but if the posterior urethra and bladder are to be medicated, then the irrigator is raised about four and a-half feet, so as to increase the pressure and force of the flow, which in a few minutes tires out and overcomes the compressor urethræ muscle and vesical sphinctus, which, relaxing, allow the solution to enter the deep urethra and bladder; when the bladder is distended, the irrigation is stopped, and the patient standing voids the solution by the urethra. The irrigations are given once or twice daily, one pint being used for the anterior urethra and two pints when the posterior urethra and bladder are to be medicated. Although this method does cause a rapid cessation of the purulent discharge, as is claimed by its advocates, it leaves

the urethra in a thickened, congested and irritable condition, which gives rise to a thin watery or mucoid discharge, which is very difficult, and in some cases impossible, to cure.

I have seen a number of patients suffering from the above conditions as a result of this treatment, all of them informing me that the method was uncleanly and painful, and a few stating that the irrigations caused quite a considerable oozing of blood from the meatus. The above facts are not to be wondered at, when one considers the force and strength of the solution rushing through, and distending such an acutely inflamed and delicate canal as the urethra is at this time; also the injurious effect of overcoming by hydraulic pressure the delicate musculature which guards the deep urethra and bladder. If so desired, the bladder and urethra may be irrigated with a small, soft-rubber catheter and hand-syringe, and most satisfactory results obtained without causing traumatism and increased congestion of the mucous membrane, with injury to the cut-off and prostatic muscles.

The new silver preparations, Argonin and Protargol, are being extensively used at present as hand-injections and irrigations in the acute stage of gonorrhœa and are said to act most satisfactorily, as they destroy the gonococci without causing any urethral pain or irritation.

In our efforts to annihilate the gonococcus we must not forget that we have a very severe inflammatory process to deal with, which is attacking one of the most delicate and highly sensitive mucous membranes in the body, and which, if roughly and unskillfully handled in

the acute stage of this virulent process, will leave the patient's urethra and contiguous structures in a more or less damaged condition.

RATIONAL TREATMENT.

Before beginning treatment we should always make a thorough examination of the penis, in order to ascertain the condition of the meatus, the glans and the prepuce, as by so doing we are often enabled to prevent certain complications and to hasten recovery.

Patients must be kept as quiet as possible, rest in the recumbent position being preferable; the diet should be light, easily digested, and contain no highly spiced or seasoned dishes, red meats or green vegetables; alcohol in all forms, as well as coffee, ginger ale and cocoa, are to be forbidden. Smoking in moderation is allowable, and does no harm, unless the patient is very nervous, when it should be cut down or prohibited.

The testicles must be supported in a snug suspensory bandage, and the penis kept scrupulously clean by the frequent use of hot water.

The bowels should be kept freely open, preferably by cathartic pills, as saline purgatives are apt to produce more or less urethral irritation. It is extremely important to warn patients of the danger of infecting the eyes and impress upon them the gravity of such an accident, also the danger of contaminating water closets, baths, towels, etc., and in this way causing the infection of others.

The best dressing for the penis is a piece of plain absorbent gauze about four inches square, with a slit cut in the center, through which the glans is passed un-

til the gauze is well behind the corona, when the foreskin is drawn forward carrying the free end of the gauze before it, thus causing it to protrude beyond the preputial orifice. The gauze may be kept wet with cold lead and opium wash if there is much redness and inflammation of the glans and prepuce.

This dressing allows the pus to drain freely from the meatus, at the same time preventing it from coming in contact with the fingers, prepuce and glans, or soiling the clothing. If the prepuce is too short to hold this dressing in place, the glans can be lightly wrapped in absorbent gauze. As soon as the dressing is removed it should be carefully burned and the hands washed, as by so doing we prevent the infection of others and the transferrence of the gonorrhœal pus to the eyes. Soaking the penis in very hot water three or four times daily allays, to a great extent, the pain and inflammation in the parts, as does also the hot sitz bath which may be taken once or twice daily. To render the urine bland the patient should drink freely of the alkaline waters and take one of the following alkaline mixtures:

R. Potass. bicarbonat., ℥j.
Tinct. hyoscyam., ℥ss.
Aq., ad ℥viij. M.
S. ℥ss in water two hours after each meal.

R. Potass. acetat., ℥j.
Syr. aurant cort., ℥ss.
Aq., ad ℥viij. M.
S. ℥ss in water two hours after each meal.

In the last formula we may substitute the bicarbonate or the citrate of potash for the acetate, if so desired.

Painful erections and *chordee.* The patient should be told to empty his bladder just before retiring, and to sleep on his side on a hard mattress with as light covering as possible. When awakened by an erection it is well to lay some cold object gently on the penis, unless, as is sometimes the case, hot applications are more beneficial, when they should be advised. Jumping out of bed into a cold bath, standing upon the hearth tiling, or placing the back against the cool wall are devices which may be tried in these cases. Painful erections and chordee can sometimes be prevented by injecting a drachm or two of the following formula into the urethra just before retiring and retaining it for several minutes:

R.	Liq. morph. Magend.,	ʒij.
	Cocaine muriat.,	gr. vj.
	Aq.,	ad ʒij. M.
S.	Inject a drachm or two at bedtime.	

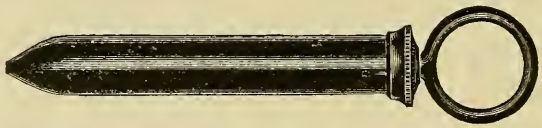
Internally we may give the monobromide of camphor, potassium bromide, chloral hydrate, or a few drops of laudanum in water three or four times daily. If these drugs do not act satisfactorily, we may be compelled to resort to suppositories of opium or morphine, but these should never be used unless absolutely necessary.

When the very acute inflammatory symptoms begin to subside, as is indicated by a diminution and thinning of the urethral discharge, less pain on urination, and a decrease in the redness and swelling of the meatus, then it is time to begin the careful and judicious use of bland and non-irritating injections, administered by the patient himself, or better still, hot medicated irrigations

given daily by the physician. In all cases, when a hand-injection is ordered, the patient should be told what kind of a syringe to purchase, and how to use it.

A good syringe is made of smooth, highly polished hard rubber, with a bluntly conical tip, holds from two to four drachms, and works smoothly and easily. (See Fig. 2.)

FIG. 2.

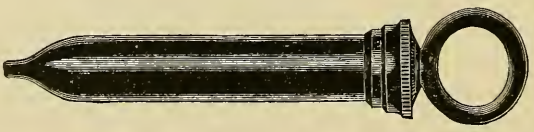


Urethral syringe.

These syringes are sometimes made with soft-rubber tips, but they possess no practical advantage over the all-hard rubber ones, and cannot be kept as clean.

For a patient with a small meatus it is well to order a syringe with a more or less pointed extremity, as is shown in Fig. 3.

FIG. 3.



Urethral syringe for small meatus.

A glass syringe, built on the same lines as shown in Fig. 2, is much less expensive than the rubber ones, and at the same time quite good, and can therefore be used in hospital and dispensary work, where the item of expense is an important one.

Injecting. The patient urinates, and standing up gently inserts the nozzle of the completely filled syringe

into the meatus, the lips of which are lightly pressed together from side to side against the syringe; the solution is then thrown in slowly until there is a feeling of distention or discomfort, when it may be allowed to escape, or, if not too uncomfortable, kept in for a few minutes. These injections should be taken two or three times daily.

It is well to begin injecting with hot boric acid solution, or a weak solution of hot lead-water; if these injections work satisfactorily, then any of the following formulæ may be used in the order given below:

℞.	Zinc. sulphat.,	gr. vj–viij.
	Liq. Magend.,	ʒij.
	Aq. destillat.,	ad ℥iv. M.
℞.	Zinc. sulphat.,	
	Plumb. acetat.,	āā gr. vj–xij.
	Ext. op. aq.,	ʒij.
	Aq. destillat.	ad ℥vj. M.
℞.	Zinc. sulphat.,	gr. xv.
	Plumb. acetat.,	gr. xxx.
	Ext. Kramer. fld.,	
	Tr. op.,	āā ʒiij.
	Aq. destillat.,	ad ℥viij. M.
℞.	Zinc. sulphat.,	
	Plumb. acetat.	āā gr. xxx.
	Aq. destillat.,	ad ℥vj. M.
℞.	Potass. permanganat.,	gr. ss.
	Aq. destillat.,	ad ℥vj. M.

In the last formula the permanganate may be increased up to one-fourth or even one-half of a grain to each ounce of water, if indicated.

If at about this time the patient can come to the surgeon every day, great benefit will be derived from the use of irrigations thrown into the bulb, instead of the hand-injections above alluded to. These irrigations are given daily or twice a day in the following manner: The patient having urinated, stands before the surgeon, who passes a No. 12 French soft-rubber "velvet eye" catheter, lubricated with pure glycerin, into the bulb, and injects from four to ten ounces of hot medicated fluid, slowly and gently by means of an Ultzmann hard-rubber hand-syringe and coupler. (See Figs. 11 and 12.) In this manner the fluid washes out the entire anterior urethra and escapes at the meatus, where it is caught in a basin. We may use for this purpose hot solutions of boric acid, or lead water to which has been added a little laudanum, and later, solutions of zinc, alum, permanganate of potash, and nitrate of silver.

In the declining part of the acute stage great benefit is derived from the use of the antiblennorrhagics, which now take the place of the alkaline mixtures.

In private practice we may prescribe Raquin's capsules of copaiba, or the Mathey-Caylus capsules of copaiba and cubebs, ordering three after each meal, or the pure yellow santal oil, put up in five- and ten-drop capsules, one or two of which are to be given an hour and a-half after meals. In ordering these capsules be sure to see that your patient gets the pure yellow santal oil, as there are so many impure and adulterated oils in the market.

In hospital and dispensary practice we are obliged to substitute the Lafayette mixture for the capsules, as the latter are too expensive for this class of patients.

Lafayette Mixture.

℞.	Bals. copaib.,	℥j.	
	Liq. potass.,	♏ij.	
	Ext. glycyrrhiz.,	℥ss.	
	Spts. æther. nitros.,	℥j.	
	Syrup. acac.,	℥vj.	
	Ol. gaulth.,	gtt. xvj.	M.
S.	℥j–ij in water after each meal.		

When the discharge becomes sticky and mucoid in character it is well to discontinue the use of these remedies, as they are apt, if continued for too long a period, to delay the cure by overstimulation of the urethral mucous membrane.

If the foregoing treatment has been successful, the patient now has but a trifling urethral discharge, sometimes only seen in the morning, with gonorrhœal shreds and perhaps a little free pus in the urine.

The treatment for this condition is so similar to that for chronic gonorrhœa or urethritis that the reader is referred to page 68, where all of the details will be found fully described.

CHAPTER V.

TREATMENT OF ACUTE POSTERIOR GONORRHŒA OR URETHRITIS.

Injections and all instrumental treatment of the urethra must be suspended as soon as symptoms of acute posterior urethritis develop; the patient is put to bed, on a milk diet, the testicles suspended, and the bowels kept freely open. Antiblennorrhagics are stopped, and in their place one of the following formulæ is given:

℞. Potass. bicarb., ℥j.
Tinct. hyoscyam.,
Fld. ext. kav. kav., āā ℥ss.
Aq., ad ℥viij. M.
S. ℥ss in water two hours after each meal.

℞. Fld. ext. trit. repent.,
Fld. ext. urvæ-ursi., āā ℥jss.
Liq. potass., ℥ss.
Tr. op., ℥jss.
Aq., ad ℥iv. M.
S. ℥j in water two hours after each meal.

Alkaline mineral waters may be taken in moderation. Hot-water bags over the bladder and on the perineum give relief, as do rectal injections of hot water or the hot sitz bath; if these means do not control the vesical and rectal tenesmus, we can then resort to morphine suppositories. If retention of urine occurs, it should be

relieved according to the methods described on page 141, to which the reader is referred.

When the frequency in urination, vesical tenesmus and other acute symptoms begin to subside, we may then resume local urethral treatment and allow the patient to be up and about.

CHAPTER VI.

COMPLICATIONS OF ACUTE ANTERIOR GONORRHŒA, OR URETHRITIS, AND THEIR TREATMENT.

BALANITIS.

Balanitis is an acute or chronic inflammatory process, attacking the mucous membrane of the glans penis, and if accompanied by inflammation of the mucous membrane lining of the prepuce is called balano-posthitis.

It is caused by uncleanliness and by allowing the gonorrhœal pus to collect beneath the foreskin, where it sets up more or less inflammation. It usually occurs in persons with a long, tight prepuce, which condition prevents retraction and proper cleansing of the parts.

The mucous membrane becomes red, thickened and covered with a thin, purulent and very offensive secretion; this is followed by swelling of the glans, which may be covered with irregular patches of excoriation; these, if untreated, may go on to superficial ulceration.

Treatment. The parts must be kept absolutely clean by washing and soaking in hot water, and separated by means of absorbent gauze wet in a weak solution of lead-water, or boracic acid; the following formula for red wash is also found very serviceable in this condition:

Red Wash.

R.	Zinc. sulphat.,	gr. xx.	
	Tinct. lavand. co.,	ʒss.	
	Aq.,	ad ℥viij.	M.
S.	External use.		

If the prepuce cannot be retracted, it may be washed out with any of the above solutions, or plain hot water, these being injected with Taylor's subpreputial syringe (See Fig. 4), an ordinary syringe, or irrigator. If

FIG. 4.

Taylor's subpreputial syringe.

there is considerable swelling of the prepuce and glans, the patient must be kept on his back, and the penis enveloped in gauze wet in cold lead and opium wash, or bichloride solution.

PHIMOSIS.

Gonorrhœal phimosis is that condition of the prepuce which renders its retraction behind the glans penis impossible. It is usually due to a balanitis, or balanoposthitis, which by its irritation causes œdema, redness and swelling of the foreskin; the œdema may be so great as to cause various deformities of the preputial orifice.

Treatment. The patient should be put on his back and the cavity of the prepuce thoroughly irrigated several times daily with hot bichloride solution, 1–5000,

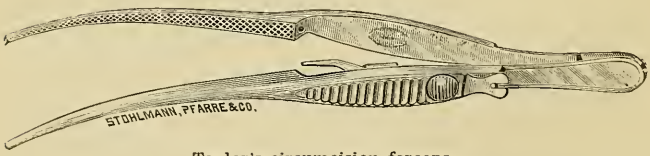
It is well to keep the penis enveloped in absorbent gauze, which is constantly wet with cold lead and opium wash.

Congenital phimosis is caused by such a degree of narrowing of the preputial orifice that the foreskin cannot be retracted beyond the glans; it is frequently complicated by bands, or adhesions running between the glans and the inner surface of the prepuce, and may, or may not, give rise to mild or very severe attacks of balano-posthitis, with painful and annoying manifestations.

Treatment. The palliative treatment consists in keeping the parts as clean and dry as possible, but circumcision should be strongly advised as the only real cure for this condition.

Circumcision. The parts are shaved and rendered surgically clean in the usual manner; the patient urinating just before the operation, which is done under ether, or cocaine anæsthesia in the following manner: The prepuce is drawn well forward, and Taylor's clamp (See Fig. 5) applied in such a manner that its blades

FIG. 5.

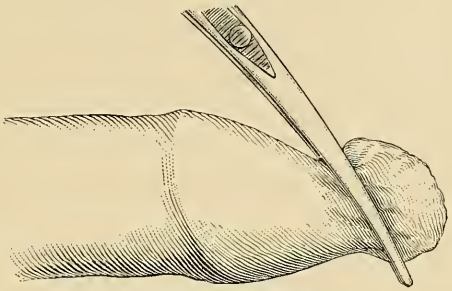


Taylor's circumcision forceps.

are exactly parallel with the corona (See Fig. 6); this gives them an oblique position as shown in the figure; the foreskin is now ablated with a pair of heavy curved scissors, cutting close to the distal side of the clamp,

which is now removed, when the integument retracts to the coronal sulcus and leaves the mucous layer of the prepuce exposed. The clamp is now applied to this layer and the cutting done in exactly the same manner

FIG. 6.



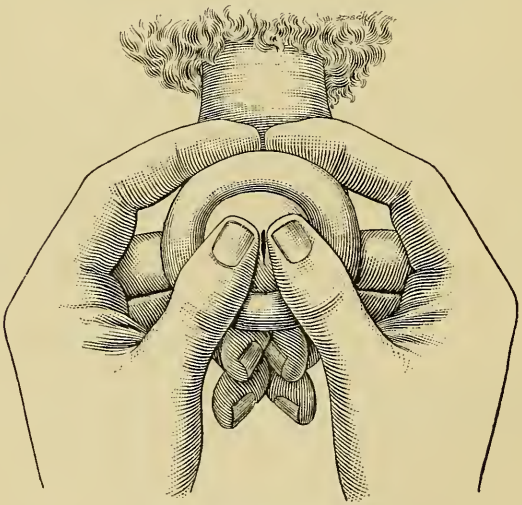
Clamp applied to foreskin.

as above described, which leaves the frænum intact and also plenty of mucous membrane. Bleeding points are caught and ligated with fine gut, and the wound closed with black silk, interrupted sutures placed about one-quarter of an inch apart. A moist bichloride dressing is then applied, and the patient kept on his back, or very quiet for a day or so. If the operation is done under cocaine anæsthesia, the solution (4 to 8 per cent.) should be injected hypodermically between the two layers of the foreskin after the clamp has been applied, and allowed five or ten minutes to act before cutting is commenced; when the tegumentary layer has been removed, a little cocaine solution may be dropped on the raw surface of the mucous layer. Local cocainization produced in this manner, renders the operation comparatively painless. Patients must be told not to soil the dressing while urinating.

PARAPHIMOSIS.

Gonorrhœal paraphimosis is that condition in which the prepuce has been retracted behind the corona glandis, and cannot be brought forward. The small preputial orifice, which is now pushed back behind the corona, forms the band of constriction on the dorsal surface of the penis, which, preventing return circulation, causes more or less deformity of the organ from œdema. This condition comes on gradually, the patient neglecting, either from ignorance, fear or shame, to take proper care of it when first discovered.

FIG. 7.



Reduction of paraphimosis.

Treatment. The deformity should be reduced immediately, in the following manner: The organ is thoroughly washed and dried, then with the two thumbs

pressing on the end of the glans, and the index and ring fingers behind the constriction and corona (See Fig. 7) the blood is entirely massaged out of the glans, which, being reduced in size and softened, is pushed back through the constricting ring, and the prepuce drawn forward. If the foregoing procedure is impossible, then a small incision must be made completely through the dorsal surface of the constricting band, after which the glans can be readily reduced and the prepuce brought forward, the little wound being dressed antiseptically and the preputial cavity kept clean.

As both of these procedures are liable to be more or less painful it is well to give the patient an anæsthetic, a few whiffs of ether or gas answering the purpose.

PERI-URETHRAL ABSCESS.

Peri-urethral abscess, or phlegmon, is situated on the under surface or sides of the penis, anywhere between the frænum and the peno-scrotal angle, the region of the frænum being the favorite location. It may occur as a complication of both acute and chronic gonorrhœa, and is probably caused by infection of a peri-urethral follicle, which as a rule goes on rapidly to abscess-formation. The abscess may be either unilateral or bilateral, especially when situated near the frænum. It feels at first like a hard, shot-like body, but when fully developed has all the characteristics of an ordinary acute abscess; and, if very large, may impinge on the calibre of the urethra and cause more or less obstruction to urination.

Treatment. Injections and all instrumental treatment of the urethra must be stopped for a time and the

inflamed parts kept at rest and covered with cold lead and opium wash or bichloride solution, which, in some cases, may lead to a disappearance of the swelling. If, however, suppuration occurs, the abscess should be laid freely open, irrigated with peroxide of hydrogen and bichloride of mercury solution, 1–3000, and packed with iodoform or sterile gauze. It is important to remember that these abscesses should not be opened until suppuration is well advanced, as by that time the urethral orifice of the follicle is closed by a plug of inflammatory material, which prevents the urine from leaking into the abscess-cavity, thus causing a urinary fistula, which is very difficult to cure in this region.

PREPUTIAL FOLLICULITIS.

Preputial folliculitis may occur at any time during the course of a urethral gonorrhœa, and is due to infection of one or more of the little follicles which are situated between the two layers of the prepuce, either on its sides, or dorsum, and which open on its free border, or on its mucous surface. In the acute stage of the infection the tissues about the follicle are acutely inflamed, and a small drop of pus exudes, or can be pressed from the tiny orifice of the abscess cavity; the folliculitis, like the urethritis, passes into the subacute, and then the chronic stage. The follicles on the under surface, and near the median line of the penis, even as far back as the scrotum, may also be infected during the course of a urethral gonorrhœa, and give rise to the same conditions as above described. If unrecognized, or untreated, these follicular abscesses and sinuses are

very liable to lead to the infection of women, and to cause auto-infection of their bearers.

Treatment. The parts should be rendered surgically clean in the usual manner, and the follicle thoroughly resected under cocaine anæsthesia, after which the little wound is brought together with two or three sutures, and a light dressing applied.

PARA-URETHRAL FOLLICULITIS.

During the course of a urethral gonorrhœa the follicle in either one or both lips of the meatus may become infected from the urethral discharge, thus giving rise to a small abscess, from the minute orifice of which a little drop of pus escapes or can be pressed. In some cases the follicle forms a sinus opening on the mucous membrane of the fossa navicularis, thus constituting a true urinary fistula. This form of folliculitis, if uncured, may cause the infection of women and auto-infection of the individual himself.

Treatment. The pus having been pressed out, the follicle is injected with pure carbolic acid, or strong nitrate of silver solution, by means of a hypodermic syringe with a blunt needle. These means failing, the little abscess must be laid open, curetted and the raw surface touched with pure carbolic acid.

COWPERITIS.

Cowper's glands, like the urethral follicles, may be the seat of abscess-formation, the infection travelling down their ducts, which open on the floor of the bulb, the glands themselves being situated between the anterior and posterior layers of the triangular ligament,

in the substance of the compressor urethræ muscle. As a rule, but one gland is affected at a time. The abscess is situated in the perineum on either side of the median line, and, if large, burrows forward and backward and may interfere with urination.

Treatment. The patient is kept in bed, and all urethral instrumentation suspended for a time. Cold lead and opium wash or bichloride solution is applied locally, which in some cases may cause resolution; if, on the other hand, fluctuation can be plainly felt, the pus must be immediately evacuated. The patient, having been etherized, is properly prepared for operation, and placed in the lithotomy position. A full-sized sound is then passed to the bladder, and held there directly in the median line, by an assistant, thus rendering the urethra prominent and preventing it from being cut or injured during the operation, as in many of these cases, when the abscess is large, the bulb of the urethra can be distinctly seen hanging in the wound, thus rendering it liable to injury if not made prominent by a sound. The abscess is then freely incised, and if burrowing has occurred in any direction it must be followed up by free incisions which thoroughly efface all blind pockets or cul-de-sacs. The abscess cavity is then irrigated with bichloride of mercury solution, packed with iodoform gauze and covered with a large pad of sterilized gauze, held in place by a T-bandage.

LYMPHANGITIS.

Inflammation of the lymphatics of the penis may occur during the acute stage of gonorrhœa, or urethritis. The vessels can be felt as hard and painful cords run-

ning along the dorsum of the organ up into the groins, where they empty into the inguinal glands. The penis becomes œdematous and enlarged, and the course of the lymphatics is marked by red lines beneath the skin, which are hot and tender to the touch. Suppuration occurs very rarely.

Treatment. The patient should be put to bed, and the penis kept in the horizontal position and surrounded by cold lead and opium wash, or bichloride solution.

ADENITIS.

The inguinal glands frequently become enlarged and tender during an acute gonorrhœa, or urethritis; but, fortunately for the patient, they very rarely suppurate.

Treatment. The patient should be kept as quiet as possible, and the groins painted with tincture of iodine, or, better still, covered with compound iodine ointment laid on a piece of gauze, and held in place by a spica bandage.

CHAPTER VII.

COMPLICATIONS OF ACUTE POSTERIOR GONORRHŒA, OR URETHRITIS, AND THEIR TREATMENT.

PROSTATITIS.

Acute congestion of the prostate to a greater or less degree usually occurs in all cases of acute posterior gonorrhœa, or urethritis. The gland becomes hyperæmic and swollen, which gives rise to a sense of fulness in the perineum and rectum, accompanied by severe vesical and rectal tenesmus, with local pain in the prostate as the fecal masses pass over it. In some cases there is great difficulty in urination, which may go on to complete retention. Frequently there are painful nocturnal pollutions which are sometimes bloody. Rectal examination shows the gland to be congested, hot and painful; firm and tense in some cases, but soft and boggy in others. As a rule, the congestion subsides as the urethritis improves, although there are rare cases in which it goes on to the formation of abscess, which, if not properly and promptly treated, may rupture into either the bladder, rectum, peritoneal cavity or perineum. Suppuration is ushered in by a throbbing pain in the prostate, rigors, rise of temperature and dribbling of the urine, which may even go on to complete retention caused by occlusion of the prostatic urethra, and compressor spasm.

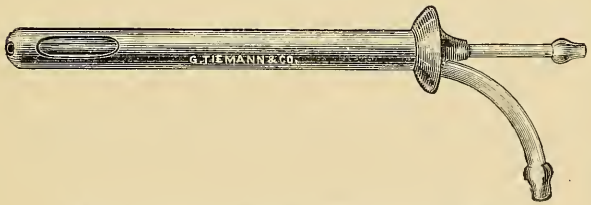
Treatment. The patient should be put to bed and

ordered a milk diet. Antiblennorrhagics, injections and all instrumental treatment must be stopped, and the urine rendered bland by the following formula, to which a little tincture of opium may be added if necessary:

℞. Potass. bicarb., ℥j.
Tr. hyoscyam.,
Fld. ext. kav. kav., āā ℥ss.
Aq., ad ℥viij. M.
S. ℥ss in water two hours after meals and at night.

The bowels should be moved freely every day. Hot-water bags over the bladder and on the perineum, and hot rectal injections given with Kemp's irrigator (See Fig. 8) or a fountain syringe afford great relief, as

FIG. 8.



Kemp's double-current, hard-rubber rectal irrigator.

does also the hot sitz bath. Morphine suppositories must be given for the vesical and rectal tenesmus when indicated.

If an abscess forms in the prostate it must be promptly opened through the perineum, by a transverse, semilunar or vertical incision, great care being taken not to wound the rectum or the urethra, which accidents can be prevented by a finger in the rectum, and a sound passed into the bladder and held there, exactly

in the median line by an assistant, who, at the same time, retracts the scrotum, thus exposing the operative field; the patient having been properly prepared and put in the lithotomy position, the pus is evacuated by a free incision and the abscess cavity irrigated, drained and dressed in the usual manner.

Chronic prostatitis as a result of posterior gonorrhœa, or urethritis, is of much more frequent occurrence than was formally supposed, and is often the cause of chronic urethral discharges, which are too frequently attributed to diseased conditions of the seminal vesicles, which in reality are of rare occurrence when compared to affections of the prostate gland itself. Chronic congestion of the prostate may also be the result of posterior urethritis, caused by excessive masturbation in young boys, and by sexual excesses in men of riper years, also long-continued and ungratified sexual desire.

Symptoms. The symptoms of chronic prostatitis are very marked in some cases and practically absent in others; there may be some frequency in urination, increased by sexual and alcoholic indulgences; nocturnal pollutions and premature ejaculation may be present, the ejaculate being blood-stained in some instances. Some subjects say they are losing their sexual desire, while others think they are more vigorous than ever. The urine is more or less cloudy, as a result of the posterior urethritis, which is almost always present in these cases, and which gives rise to a varying amount of urethral discharge. In advanced cases there is an oozing of prostatic fluid after urination and defecation, especially when the bowels are constipated; this greatly alarms nervous and excitable individuals. Some sub-

jects complain of a sensation of fulness and distress in the rectum and perineum, which is greatly increased by defecation and coitus, also by long walks, over exercise, bicycle and horseback riding, and standing for a long time. Catching cold aggravates any or all of the above symptoms.

Diagnosis. The diagnosis of chronic prostatitis can only be arrived at by making a careful rectal examination, when the gland will be felt, either enlarged, tender, soft and boggy, or very tense and firm. Digital pressure on the gland will usually cause an oozing of prostatic fluid from the meatus, which should always be collected and examined microscopically. As a general rule, the enlargement is most marked on the left side.

Treatment. If the gland is soft and boggy it should be gently massaged about once a week, but if firm and tense very little if any benefit will, as a rule, be derived from this treatment, although it may be tried. The rectum should be irrigated once or twice a day with hot or cold water, by means of a Kemp's double-current irrigator, or fountain syringe, and the bowels kept open. Normal sexual relations are not harmful. The urethritis, or urethro-cystitis, should be handled in the manner already described for these conditions, and strychnine, quinine and ergot given to tone up the general and local condition.

EPIDIDYMITIS AND EPIDIDYMO-ORCHITIS.

Epididymitis is one of the most frequent complications of acute gonorrhœa, or urethritis, and consists of an acute inflammation of the epididymis, which, if it extends to the testicle, is called epididymo-orchitis. In

severe cases the vas deferens is also involved in the inflammatory process, and the tunica vaginalis may be the seat of an acute hydrocele.

Swelled testicle (epididymitis or epididymo-orchitis) usually occurs during the first three weeks of gonorrhœa, and is caused by an extension of the inflammatory process from the floor of the posterior urethra into the ejaculatory duct, and thence to the epididymis and testicle. It is unilateral in the majority of cases, although both glands may be attacked at the same time, or successively.

Symptoms. The symptoms of epididymitis and epididymo-orchitis will be described together, as they are practically the same. The patient usually has all the symptoms of an acute posterior gonorrhœa, or urethritis, when suddenly or gradually he complains of pain in the testicle, and a dragging, aching sensation extending up the cord, groin and even to the kidney.

There is a rise in temperature, accompanied by chilly sensations or a well-marked chill, which is followed by a feeling of general malaise. As the inflammation in the epididymis and testicle increases all of the above symptoms become more marked, the temperature sometimes going to 105° F.; the pain in the testicle, groin and lumbar region becoming so great that the patient has to lie down, supporting the scrotum with his hand. The intensity of these symptoms varies greatly in different individuals, some being compelled to go to bed, while others are up and about attending to their ordinary duties.

Examination. The scrotum is hot, red and œdematous. The epididymis, either in part or in whole, is

enlarged, hard and exquisitely tender; if the testicle be involved, it also is very painful, firm and enlarged, becoming in severe cases as large as an ordinary orange. There may be an accumulation of hydrocele fluid in the cavity of the tunica vaginalis. The entire cord is sometimes painful and thickened and can be felt as far up as the ring.

The duration of the attack depends greatly on the treatment, and whether the epididymis or epididymis and testicle be involved.

Treatment. The patient should be put to bed and given the general treatment for acute posterior gonorrhœa. (See page 40.) The scrotum is supported by a band of rubber plaster three to four inches wide, which passes beneath the scrotum to each thigh, care being taken to have the thighs close together before applying the plaster. If there is much hair on the thighs it should be shaved to prevent pain when the plaster is removed. The scrotum over the affected testicle should be lightly touched with the curved tip of the Paquelin cautery, or the cautery held so close to the scrotum that sharp counter irritation is produced; for the same purpose a solution of nitrate of silver, 60 grains to the ounce of distilled water, may be painted over the scrotum, care being taken that it does not stain the fingers or bed clothes; after either of these procedures the entire scrotum, properly supported, is surrounded with absorbent gauze, which is kept covered, day and night, with cold lead and opium wash. When the acute inflammatory symptoms have subsided, as a result of the above treatment, an ointment of lead and opium is spread over the scrotum, which is then surrounded by a

layer of cotton-wool over which is placed a piece of oiled silk, the whole dressing being kept in position by a snug suspensory bandage. The patient is allowed to get up when local pain and tenderness have disappeared. If there is very marked hydrocele, great relief can often be afforded by careful aspiration of the fluid, thus relieving the local pain and tension.

Chronic or relapsing epididymitis is only cured by treating the lesions in the posterior urethra; in other words, by treating the chronic posterior gonorrhœa, or urethritis, which is the cause of the testicular trouble. For this treatment the reader is referred to page 75.

The little hard mass in the epididymis, which is the result of the inflammatory process, should be gently rubbed with mercurial or icthyol ointment, covered with cotton and oiled silk, and properly supported in a bandage. Iodide of potash combined with this local treatment will, as a rule, cause softening and absorption of the chronically enlarged epididymis which, if left untreated, may result in partial, and even complete sterility, if both epididymes have been involved.

SEMINAL VESICULITIS.

By seminal vesiculitis or spermato-cystitis is meant an inflammation of the seminal vesicles, which may be either acute or chronic. When gonorrhœal in origin it occurs about the same time as epididymitis; that is, during the first three weeks of the disease. The inflammation passes directly from the floor of the posterior urethra through the common ejaculatory duct to either one or both vesicles.

Symptoms. The symptoms of acute seminal vesic-

ulitis are practically the same as those of acute posterior urethritis or acute prostatitis, the patient having frequent and painful urination with vesical and even rectal tenesmus. There may be painful nocturnal pollutions stained with blood. These patients usually complain of a feeling of fulness just within the anus or in the perineum. In severe cases there is more or less fever, accompanied by a feeling of general malaise.

Diagnosis. The diagnosis is arrived at by making a rectal examination, when the vesicle or vesicles can be felt as hot, swollen, tender bodies situated just beyond the base of the prostate and running upward and outward. For this examination, the patient should be in Fuller's position, that is, standing up, with the trunk bent at right angles to the thighs, the feet apart and the palms of the hands resting on the seat of an ordinary chair. The right index finger is used for examination and should be well anointed with vaseline.

Treatment. The treatment is the same as that for acute posterior gonorrhœa, or urethritis, except that cold water may be injected into the rectum instead of hot water, if it gives more relief.

Should the inflammation go on to abscess-formation, the pus must be immediately let out by a transverse, vertical or similunar incision through the perineum just in front of the anus, great care being taken not to wound the urethra or rectum, which can be prevented by having a sound held in the urethra, and the index finger in the rectum, with its tip in contact with the apex of the prostate gland. The abscess-cavity is irrigated, packed and dressed in the ordinary manner.

Chronic seminal vesiculitis may follow the acute

form, or be caused by the extension backward of a chronic, and low-grade inflammation in the posterior urethra, or prostate, the result of gonorrhœa, excessive masturbation and sexual excesses.

Symptoms. The symptoms of chronic seminal vesiculitis are varied, and differ greatly in different individuals, some complaining that they are losing their sexual appetite and powers, others that they have nocturnal pollutions and premature ejaculations, both of which may be blood-stained; these conditions may or may not be associated with a mucoid or muco-purulent urethral discharge, which varies greatly at different times, and according to the habits of the individual. Some complain of a sense of weight and fulness in the rectum and perineum, while others are absolutely free from these sensations, the only symptom of the disease being a cloudy urine with flakes, and slight discharge at the meatus. Some patients have constant and greatly increased sexual desire, with perhaps little relief after intercourse.

Diagnosis. The symptoms of chronic seminal vesiculitis are so similar to those of chronic prostatitis and posterior urethritis that a correct diagnosis can only be arrived at by making a careful rectal examination as described in the acute form. When diseased, the vesicle or vesicles can be plainly felt by the skilled finger, running up and out from the base of the prostate gland.

Treatment. The vesicle or vesicles can be gently massaged about once a week, and the patient given the regular treatment for chronic posterior urethritis and prostatitis, the details for which will be found on page 75.

URETHRO-CYSTITIS.

Urethro-cystitis is not an uncommon complication of acute posterior gonorrhœa, or urethritis, and is caused by an extension backward of the inflammatory process from the posterior urethra into the bladder. As a rule, the inflammation is limited to the mucous membrane surrounding the urethral orifice, but may extend and involve the entire bladder surface.

Symptoms. The symptoms of acute urethro-cystitis are practically the same as those of acute posterior gonorrhœa, or urethritis, except perhaps that they are more severe in character, the patient also complaining of a constant deep-seated pain over the bladder.

Treatment. As in acute posterior gonorrhœa, or urethritis, these patients should be kept in bed, with hot applications over the bladder and on the perineum; hot sitz baths and hot rectal irrigations afford great relief. All instrumentation of the urethra must be suspended, the patient put on a milk diet, and the urine kept bland by means of the prescription already given for acute posterior gonorrhœa, or urethritis. Tenesmus must be controlled by morphine, either in suppository or by hypodermic. The patient may drink Poland, Vichy or Bethesda water, but not in too great quantity. It is very important to keep the bowels moving freely and for this purpose we may employ any good cathartic pill. As soon as the acute symptoms subside, the posterior urethra and bladder should receive proper local treatment by means of irrigations or instillations, the technique for which is fully described in Chapter XIII.

CHAPTER VIII.

CHRONIC GONORRHŒA, OR URETHRITIS.

CHRONIC gonorrhœa, or urethritis, also known as gleet, is spoken of as chronic *anterior* gonorrhœa, or urethritis, when the lesion is situated somewhere in the *anterior urethra;* as chronic *posterior* gonorrhœa, or urethritis, when in the *posterior urethra;* as chronic *antero-posterior* gonorrhœa, or urethritis, when the *entire* urethra is involved, and as chronic *urethro-cystitis* when the disease has invaded the *bladder.*

A gonorrhœa, or urethritis, becomes chronic when it has existed for more than eight or ten weeks.

Causes. The causes of chronic gonorrhœa, or urethritis, are many, prominent among them being sexual and alcoholic indulgences during the declining stage, patients thinking themselves cured at that time as they see no discharge at the meatus, and therefore stopping treatment at this the most important period in their disease. Gonorrhœa is apt to run a chronic course in debilitated, run-down and anæmic subjects, also in those who will not, or cannot, take sufficient rest or proper treatment in the acute inflammatory stage of the disease.

The numerous so-called abortive methods, with strong injections, retrojections, irrigations and endoscopic applications during the acute inflammatory stage, are very liable to leave the patient with a thickened urethra, congested prostate and a chronic watery discharge that is most rebellious to any and every form of treatment.

Chronic congestion and inflammation of the prostate gland, as a result of gonorrhœa, is a frequent cause of chronic urethral suppuration, and should therefore not be overlooked in the treatment of these cases. Seminal vesiculitis is undoubtedly the etiological factor in some cases of chronic gonorrhœa, but is very rare indeed, as compared to chronic affections of the prostate gland. An abnormally small meatus, or a condition of phimosis, associated with balano-posthitis, may, from the irritation they produce, be important factors in the continuation of a chronic urethritis.

Uncured preputial folliculitis, para-urethral folliculitis, or infection of any of the glands or follicles opening into the anterior urethra, may cause the lighting up, or prolongation of a gonorrhœa; therefore these little structures should receive due consideration and treatment.

Warty growths in the anterior urethra may, from the irritation they occasion, keep up a urethral discharge for a long time, unless diagnosticated by endoscopic examination, which is permissible in very chronic and rebellious cases.

CHAPTER IX.

CHRONIC ANTERIOR GONORRHŒA, OR URETHRITIS.

Symptoms. The symptoms of chronic anterior gonorrhœa, or urethritis, are as follows; in some cases the lips of the meatus are glued together in the morning by the discharge which has accumulated in the urethra during the night; in others there is a variable amount of muco-purulent, mucoid or serous discharge at the meatus, which is commonly known as the "morning drop;" and which is usually increased after sexual or alcoholic indulgence. In still other cases there is neither gluing of the meatus nor "morning drop," the only symptom of the chronic inflammation being gonorrhœal flakes and shreds in the urine. In the majority of cases there is no visible discharge at the meatus during the day, as the urethra is so frequently flushed out by the stream of urine. Patients usually complain of a dribbling of urine (a few drops up to a drachm) after each act of urination; this is due to a loss of elasticity of the urethral walls as a result of the chronic inflammation, which leaves them in a more or less rigid condition, and unable to empty themselves completely.

The Thompson two-glass test, for the differentiation between chronic anterior and chronic posterior gonorrhœa should not be relied on, as it is only applicable to acute cases, associated with much suppuration.

Gonorrhœal shreds, threads or flocculi consist of moist scales made up of pus and epithelial cells, and held

together by fibrin or mucus; they are situated upon spots of congestion, erosion and superficial ulceration along the urethral walls which mark the localities where the gonorrhœal process has been most severe. These congested, eroded or ulcerated patches form the lesions of chronic gonorrhœa, or urethritis, and are most commonly found in the bulbous urethra, as this portion of the canal is dilated (33 to 36 F.), has no capsule, is surrounded by erectile tissue, and being dependent, drains poorly; all of the above conditions greatly favoring a long-continued inflammatory process.

When the stream of urine strikes the edges of these moist scales it rolls them up, and they therefore appear as threads or shreds floating in the glass of urine.

As the healing process advances the pus-cells disappear, the flocculi being made up entirely of epithelial cells, which, when the case is cured, also vanish, leaving a clear, transparent urine.

In a general way it may be stated that the threads or shreds from the anterior urethra are usually long, thread-like in character, and float about for some time in the urine, while those from the posterior urethra are lumpy and ragged in appearance, and sink rapidly to the bottom of the glass, but too much reliance must not be placed on these conditions. Microscopically they are both found to be composed of the same elements.

CHAPTER X.

CHRONIC POSTERIOR GONORRHŒA, OR URETHRITIS.

ALTHOUGH chronic posterior gonorrhœa, or urethritis, may occur alone, it is accompanied in the vast majority of cases by a chronic bulbous urethritis, as well as by some chronic urethro-cystitis, which in turn may be associated with prostatitis, or, in some rare cases, seminal vesiculitis, which conditions must not be forgotten in its treatment.

Symptoms. The typical symptoms of chronic posterior gonorrhœa, or urethritis, are increased frequency of urination with a feeling of discomfort either at the beginning or termination of the act, and absence of, or a very slight discharge at the meatus. The urine may or may not be turbid and contains thick, clumpy shreds from the posterior urethra, which sink rapidly to the bottom of the glass. In some cases there are frequent nocturnal pollutions, which may be bloody; in others premature ejaculation at intercourse, associated with dull, painful sensations in the region of the prostate. These sexual manifestations are due to the congested and inflamed condition of the posterior urethra and prostate gland.

The above symptoms vary widely in different individuals, in some well-marked and constant, in others very slight and only brought into activity by alcoholic and sexual indulgences, which cause a congestion of the

posterior urethra and prostate, with a lighting up of the dormant inflammation.

If, as is usually the case, the patient also has an anterior gonorrhœa, a more marked discharge will then be noticed at the meatus.

CHAPTER XI.

TREATMENT OF CHRONIC GONORRHŒA, OR URETHRITIS.

In all cases of chronic gonorrhœa, or urethritis, either anterior, posterior or antero-posterior, the morning urine should be carefully examined in order to ascertain to what extent and degree the urethra is involved.

If urination is painful the patient should take an alkaline mixture and drink freely of the alkaline waters. Coffee and alcohol are to be stopped until the case is well under control, when they may be resumed in moderation. The diet should be nutritious, but simple, the patient avoiding all highly spiced and seasoned dishes. As soon as the pain or smarting on urination ceases, great benefit will be derived from the use of the antiblennorrhagics.

All sexual excitement must be strictly guarded against, as it causes urethral and prostatic congestion and thus retards a cure.

If the urine contains free pus as well as gonorrhœal threads it is best to begin with the retrojection treatment, which consists of throwing into either the anterior or posterior urethra several ounces of warm medicated fluid. When from this method the pus disappears, and nothing but threads remain in the clear urine, then it is time to stop retrojections and substitute for them instillations, which will be described in detail farther on.

If chronic gonorrhœa, or urethritis, is complicated by stricture of the urethra, prostatitis, seminal vesiculitis, an abnormally small meatus, or phimosis associated with balano-posthitis, these conditions should receive appropriate treatment which will be found fully described under these separate headings, and to which the reader is referred.

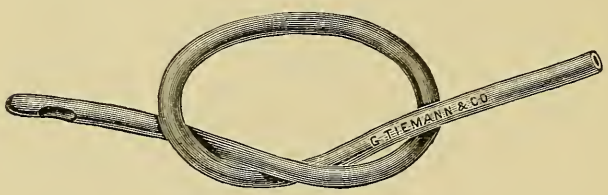
CHAPTER XII.

TREATMENT OF CHRONIC ANTERIOR GONORRHŒA, OR URETHRITIS.

THE general rules, described in the previous chapter having been minutely carried out, the anterior urethra is irrigated in the following manner:

The patient passes his urine in order to flush out the canal; then a thoroughly clean No. 12 French soft-rubber velvet-eye catheter (See Fig. 9) or a Mitchell's

FIG. 9.



Soft-Rubber Velvet-Eye Catheter.

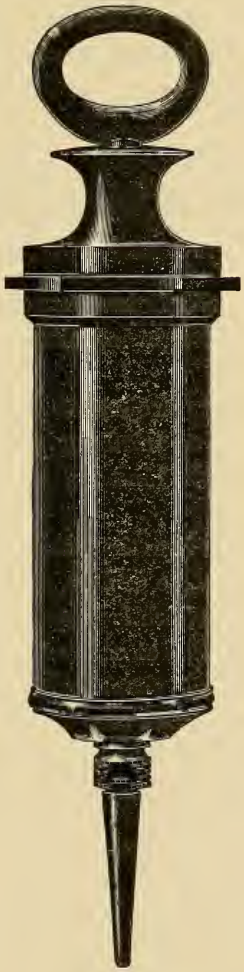
soft-rubber reflux catheter (See Fig. 10) is lubricated sparingly with glycerin and passed very gently into the bulb of the urethra, the patient standing up before the

FIG. 10.

Mitchell's Reflux Catheter.

surgeon. An Ultzmann four-ounce hard-rubber hand-syringe (See Fig. 11) is then attached to the end of the

FIG. 11.



Ultzmann syringe.

catheter by means of a conical hard-rubber coupler (See Fig. 12), and the warm medicated fluid injected

slowly and gently into the bulb of the urethra, beyond which it does not pass on account of the compressor urethræ muscle, but flows forward and escapes at the meatus, where it is caught in a suitable vessel.

Fig. 12.

Hard-rubber coupler.

In this manner all of the diseased areas in the anterior urethra are brought into direct contact with the medicated solution.

The irrigations or retrojections may be given every day or every second or third day, according to the results obtained and the kind and strength of the solution employed.

On the alternate days the patient can use an ordinary hand-injection if so desired, and provided it does not cause irritation, which is frequently the case. The amount of solution used at each sitting varies from two to eight ounces, and should always be warm, and thrown in with the utmost care and gentleness.

For retrojection solutions we use the following formulæ in the order given and manner described.

Solution I.

℞. Alum. crud.,
Zinc. sulphat., āā 2.00.
Aq. destillat., 500.00. M.

Sig.—Add half an ounce of this solution to seven and a-half (7½) ounces of warm boiled water, and inject. Increase strength from day to day until equal parts of solution and water are used.

Solution II.

℞. Potass. permanganat., 1.00.
Aq. destillat., 500.00. M.

Sig.—Add one-quarter ($\frac{1}{4}$) of an ounce of this solution, to seven and three-quarters ($7\frac{3}{4}$) ounces of warm boiled water, and give a retrojection every day, or every other day, increasing the strength slowly up to 1–1000.

Solution III.

℞. Argent. nitrat., 1.00.
Aq. destillat., 500.00. M.

Sig.—Use in precisely the same manner as the second solution, increasing the strength very slowly, as the silver is liable to cause severe pain, irritation and tenesmus if used too strong.

In the same manner may be used very weak solutions of the bichloride of mercury, and the chloride of zinc, beginning with about 1–40,000, and increasing the strength very slowly and guardedly.

If at about the end of the twelfth or fourteenth week of the disease the patient still complains of a dribbling of urine from the meatus after urination, good results will be obtained by the judicious use of medium-sized steel sounds passed to the triangular ligament every fifth to seventh day, and left in the urethra for about a minute; the pressure which the sound exerts helps to restore the lost elasticity of the urethral walls, and in that way cures this troublesome and disagreeable symptom.

In the majority of cases of chronic anterior gonorrhœa, or urethritis, sounds should not be employed until at least three months after the acute stage, after which

time they are of great service in certain selected cases, but must not be used as a routine treatment.

If, after using the above irrigations in the manner described, the urine still contains gonorrhœal shreds, it is advisable to give the patient instillations in the anterior urethra. This method is fully described on page 77.

CHAPTER XIII.

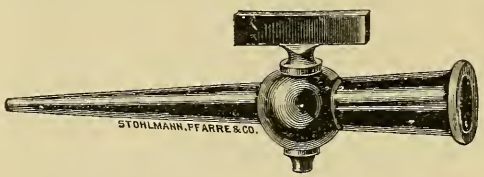
TREATMENT OF CHRONIC POSTERIOR GONORRHŒA, OR URETHRITIS.

The general lines of treatment described in Chapter XI. having been instituted, the posterior urethra and bladder are irrigated in the following manner:

The patient, having urinated, to cleanse the canal, lies down with head and shoulders elevated and muscles relaxed, and a thoroughly clean, No. 12 to 14 French soft-rubber catheter dipped in glycerin is gently passed into the prostatic urethra, so that its eye is just beyond the compressor urethræ muscle. In some rare and exceptional cases it will be found impossible to pass a soft-rubber catheter beyond the compressor urethræ muscle. For these cases we can substitute a small woven-silk catheter, which, although more rigid than the rubber one, is flexible and less liable to cause irritation than the metal instruments, which are sometimes recommended for this purpose. This spasm of the compressor muscle is, as a rule, caused by rough, rapid and unskillful instrumentation of the anterior urethra with large or rigid instruments, and will rarely if ever be encountered provided the surgeon is gentle and skillful and uses soft and flexible catheters in preference to metal, or rigid ones. The Ultzmann syringe is attached to the free end of the catheter by means of a hard-rubber coupler with stopcock (See Fig. 13), and the warm fluid thrown slowly and gently into the prostatic urethra, from which

it passes to the bladder. When the syringe is empty the stopcock is turned off, the syringe uncoupled, refilled, and more fluid injected until the bladder feels

Fig. 13.



Author's hard-rubber coupler with stopcock.

full, or the patient complains of a desire to urinate, when the catheter is withdrawn. The patient now stands up and passes the medicated fluid, which, having already acted on the posterior urethra and bladder, washes out the posterior urethra a second time, and flowing through the anterior urethra distends it as it rushes out, and in this manner medicates all of the congested, eroded or ulcerated spots and patches along the canal.

The solutions to be used for these irrigations are the same as those given for chronic anterior gonorrhœa, or urethritis, on page 72. They must always be warm, and increased very slowly in strength, especially the nitrate of silver and bichloride of mercury solutions, which, if too strong, will set up intense vesical and rectal tenesmus, which may last for several hours. The fluid should always be injected with a four- or five-ounce hand-syringe, as with it we know the exact amount of solution thrown in, the resistance offered by the bladder, and the force used; whereas if an irriga-

tor were employed, none of the above information could be obtained, and more or less damage might be done.

The amount of fluid used at each sitting varies, a good average being about eight ounces, although many bladders will not hold more than from four to six ounces at first; this is probably due to the irritability of the posterior urethra and more or less contraction of the bladder, which has been produced by the frequent calls to expel the urine during the acute attack; this irritability subsides rapidly under the treatment, and patients frequently speak of the comfort they experience after the first few washings.

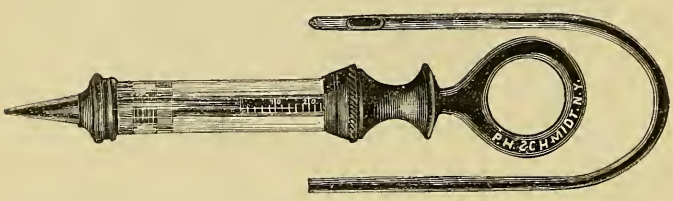
If, in spite of the above treatment, carefully carried out, the urine does not clear up promptly, then the prostate, seminal vesicles and ampullated ends of the vasa deferentia must be examined per rectum, and if found affected, treated as already described in the chapters devoted to these subjects.

If a patient have a chronic antero-posterior gonorrhœa, or urethritis, and this is usually the case, the treatment is exactly the same in every detail as that just given.

If, after having used the retrojections the urine clears up but still contains gonorrhœal threads, then it is advisable to change our plan of treatment by using small amounts of concentrated solutions; these are called instillations, and are given in the following manner: After the patient urinates we pass a properly cleansed No. 12 French soft-rubber catheter, lubricated with glycerin into the posterior urethra if posterior urethritis exists, or into the bulb of the urethra if we have only an anterior urethritis to deal with, and by means of a

Taylor's instillation syringe (See Fig. 14) we throw in several drops of a 1–2000 solution of nitrate of silver, the catheter is then drawn slowly out of the urethra, while at the same time we may inject a few drops of the silver solution into the bulb and pendulous portion.

Fig. 14.



Taylor's Instillation Syringe and Catheter.

These instillations should be repeated every third, fourth or fifth day, according to the results obtained. In some rebellious cases we may be compelled to increase the strength of the silver solution up to 1–1000, 1–500, or even 1–250; this should be done very slowly and carefully, and the instillations given at longer intervals, our guide in these cases being the urine, which should be examined at each visit. Instillations of strong solutions of the bichloride of mercury will be found useful in some cases, also 1 to 3 per cent. sulphate of copper solution, or 3 to 6 per cent. sulphate of thallin solution.

If, as is sometimes, although very rarely, the case, a soft-rubber catheter cannot be passed beyond the compressor urethræ muscle, we can then use a small, straight woven-silk one, or the drop-catheter of Ultzmann (See Fig. 15), which consists of a silver catheter 16 cm. long, with capillary bore and thick walls, holding ex-

actly two drops; to the extra-vesical end of the catheter is attached a hard-rubber hypodermic syringe, by means of which the operator can deposit with accuracy a given number of drops into the prostatic or bulbous urethra.

FIG. 15.

Ultzmann's drop-catheter.

CHRONIC CYSTITIS.

For chronic cystitis, following a gonorrhœa, or urethritis, we employ these same irrigations, filling the bladder completely and distending all of its folds, so that every part of the inflamed bladder mucous membrane comes in direct contact with the solution and is thereby acted on. As the patient voids the solution it medicates the mucous membrane of his prostatic urethra, which was the starting point and cause of the cystitis, so that in this manner we treat not only the bladder, but the entire length of the urethral canal.

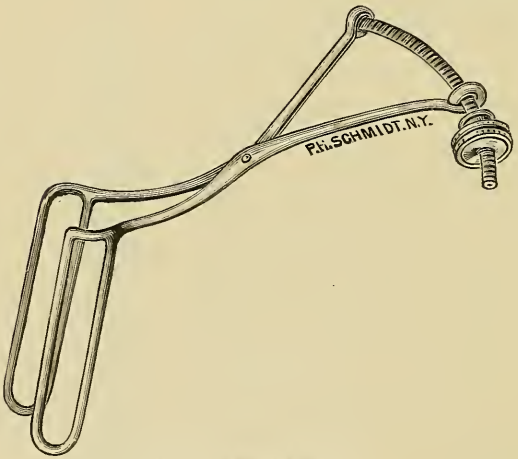
There are some cases, however, of chronic gonorrhœal cystitis and urethro-cystitis which resist all forms of local and medicinal treatment, applied in the most skillful manner and for a sufficient length of time. These cases must be subjected to bladder-drainage through the perineum, the tube being left in for a vari-

able length of time, depending on the results obtained. In this manner the urethra and bladder have absolute rest, and at the same time can be treated and irrigated as the surgeon deems advisable. This operation will be found fully described on page 133.

ENDOSCOPY.

The use of the endoscope, in the treatment of chronic gonorrhœa, or urethritis, is sometimes of service in those rare cases which have resisted the different forms of

FIG. 16.



Taylor's meatus-speculum.

treatment already given for these conditions. It should only be employed in certain selected cases, in the chronic stage of the disease, and by one who is skilled in the use of urethral instruments and accustomed to the appearance of the urethral walls, both in their normal and diseased states. By its aid we can examine with

the eye the entire length of the urethra, recognize polypoid growths, and in some cases locate the areas of disease and treat them locally by topical applications of various drugs.

It must be remembered, however, that the endoscope is at best an instrument of reserve, and should never be employed in a routine manner, as its frequent passage through the urethra causes more or less irritation and congestion of this sensitive and highly vascular mucous membrane.

For examination of the fossa navicularis, Taylor's meatus-speculum (See Fig. 16) will be found very useful, the fossa being illuminated by direct sunlight, or, if that is not sufficient, the rays can be reflected in by means of a head-mirror.

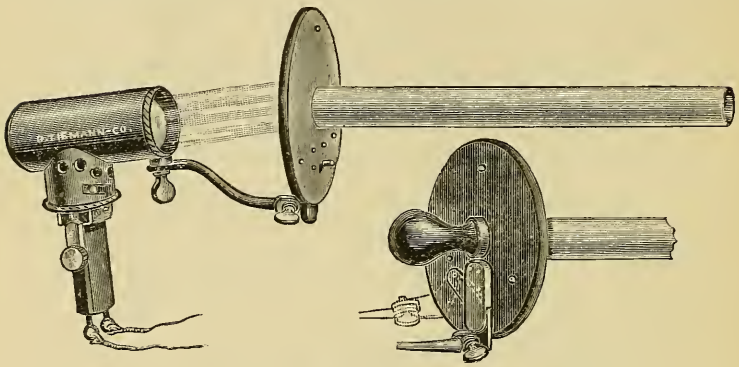
For general endoscopic work the W. K. Otis "perfected" urethroscope is, in my hands, by far the best instrument we have. (See Fig. 17.)

It is very light, weighing less than an ounce, easily cleaned, adapted to the Klotz tube, and illuminates the urethral field most brilliantly by means of a small electric lamp and lens. A portable electric-light battery of six cells gives all the required illumination, which may also be obtained from the Edison street current, properly modified by resistance lamps.

The patient, having urinated, lies on his back with the buttocks resting on the extreme end of the operating table, and his thighs supported by proper foot rests or two ordinary stools. A Klotz tube that will enter the meatus with ease is then selected, cleansed, lubricated with glycerin and passed slowly and gently into the bulb of the urethra (in rare cases into the prostatic

urethra), the obturator withdrawn, and the light turned on; the urethral walls are then seen bulging into the lumen of the tube, which being slowly withdrawn, gives

FIG. 17.



The W. K. Otis "perfected" urethroscope.

a clear and distinct picture of the entire canal from behind forward. As diseased areas are discovered they may be touched with strong solutions of silver nitrate or copper sulphate by means of wooden applicators wrapped with absorbent cotton, which has been dipped in the medicated solution.

WHEN IS GONORRHŒA CURED?

Having considered the treatment of gonorrhœa and its complications, the important question now arises, When is it cured, or at what time does the discharge lose its infectiousness? In order to answer these questions properly we must examine the patient's *morning urine, passed in our presence*, for several successive mornings, and if it is clear and contain neither pus nor

gonorrhœal shreds ; that is, if it be perfectly normal on repeated examinations, we know that the urethral lesions at least have been cured. If, on the other hand, there are shreds, which under the microscope are found to consist of pus and epithelial cells, whether they contain gonococci or not, we know that the urethral lesions are still uncured, and that the secretion may be infectious. If the shreds consist of epithelial cells alone, they, of course, in themselves, may not be dangerous ; but even these patients must be warned not to have sexual relations, and advised to take a proper course of treatment. In order to ascertain that there is no lurking trouble in the prostate, seminal vesicles or ampullated ends of the vasa deferentia, as a result of posterior gonorrhœa, or urethritis, the patient should pass the first half of his urine, and then standing in the proper position (see section on seminal vesiculitis) have his prostate, vesicles and vasa deferentia examined and massaged by a finger in the rectum ; the material appearing at the meatus is received on a glass slide and kept for examination ; the patient now passes the second half of his urine, which washes out any remaining secretion that has been expressed into the urethra ; the sediment of the second urine and the material caught at the meatus are examined microscopically, and if the findings show disease these conditions must be treated as already described under chronic prostatitis and seminal vesiculitis. The examiner must be familiar with the normal secretions of the prostate, vesicles and ampullæ, so as not to err in his microscopic findings. The physician cannot be too guarded in giving his opinion on this subject, and should, therefore, make the

above examinations in a most thorough and careful manner, and warn patients against matrimony or sexual relations until they are absolutely cured. The follicles in the integument of the penis, between the two layers of the prepuce, in the lips of the meatus, and also the glands that open into the anterior urethra should be carefully examined, in order to ascertain that they are free from the gonorrhœal process.

CHAPTER XIV.

GONORRHŒAL OPHTHALMIA.

GONORRHŒAL ophthalmia in the adult is caused by the transferrence of gonorrhœal pus from the genitals to the eyes by means of the fingers, dressings or towels.

In the newly born the infection occurs during parturition, from the gonorrhœal pus in the mother's vaginal tract.

Symptoms. The symptoms usually begin within a few hours after infection, and consist of redness and swelling of the conjunctiva, increased lachrymation, with a collection of mucus at the inner angle, which is accompanied by intense itching and a feeling as if foreign bodies were beneath the lids.

The conjunctivitis soon involves both of the lids, as well as the ocular mucous membrane, and is associated with a profuse purulent secretion, which flows out from between the intensely red and greatly swollen lids. The patient is at this time unable to open the eye, or eyes, voluntarily.

The foregoing manifestations are accompanied by intense pain in the eyeball, forehead and temple, with rapid pulse, rise of temperature, and general malaise.

Prognosis. The prognosis is always grave, and depends greatly upon the time the patient applies for treatment, whether one or both eyes are attacked, and the extent and situation of the ulceration. It is at best one of the most serious complications of gonor-

rhœa, and as it may result in either partial or complete blindness the prognosis must always be made in a most guarded and careful manner.

Treatment. The patient is put to bed in a well-ventilated room and two competent nurses are employed, one for day and the other for night. If only one eye is affected, the sound one is covered with a shield to prevent its infection; the shield is made of two pieces of rubber plaster, one four and the other four and one-half inches square, with their adhesive surfaces in contact, between which, in a hole made in the center, a deeply concave watch-glass is fastened; through this glass the patient can see and the eye be inspected by the physician; the rubber plaster is fastened to the skin about the eye, and its edges sealed with collodion. The nurses must be warned of the danger of infection, and told how to avoid it by keeping their hands and nails clean, and by wearing large, plain-glass spectacles to protect their eyes during the dressings and irrigations.

The eye must be washed out day and night with a 3 per cent. solution of cold boric acid (made with distilled water) as often as any secretion accumulates, and in the intervals between the washings the eye should be kept covered with cold cloths (absorbent gauze or sheet lint) taken from a block of ice, and changed every two or three minutes; these cloths must be burned as soon as removed, and never used again. The eye is flushed out by means of an irrigator, held high enough to allow the cold boric-acid solution to flow out in a gentle stream. From the onset of the infection well up to the declining stage two drops of a 2 per cent. solution of nitrate of silver should be dropped into the eye once or twice

in twenty-four hours, according to the severity of the inflammation; the silver-nitrate solution being applied directly after a boric-acid washing. If the cornea becomes involved, instillations of a sulphate of atropine solution (gr. ij–ʒj) should be employed three times daily, and the nitrate of silver stopped.

Unless the attending physician is very familiar with diseases of the eye, he should send immediately for a competent ophthalmic surgeon, as a faulty treatment may result in the loss of either one or both eyes.

CHAPTER XV.

GONORRHŒAL RHEUMATISM.

Gonorrhœal, or blennorrhœal, rheumatism is an inflammatory process which may occur during the course of urethral gonorrhœa, gonorrhœal vulvitis, vaginitis and conjunctivitis. It attacks the joints, bursæ, muscles, nerves, fibrous tissues, sheaths of tendons and the eye.

It complicates about 10 per cent. of all cases of gonorrhœa, and is observed more frequently in men than in women; in some cases it accompanies every attack of urethral gonorrhœa, in other cases only one.

From what has been learned in regard to the origin and nature of gonorrhœal rheumatism, it may be said that the chief etiological factor is the gonococcus and its toxins, which may be associated with pyogenic microbes. It has been clearly demonstrated by competent observers that the gonococcus is carried by the blood current and deposited in the various tissues of the body. If the exudation in the joint be serous or sero-fibrinous in character we find the gonococcus, but if sero-purulent or purulent we discover pyogenic microbes.

Gonorrhœal rheumatism may appear at any time from the end of the first week to the fourth month of the disease, the majority of cases occurring in the chronic stage, which has led to the theory that the septic material (gonococci or their toxins) is only absorbed from the posterior urethra, which, as a rule, is corroborated

by clinical observation, as in the vast majority of cases rheumatic manifestations do not develop until the posterior urethra has been invaded by the gonorrhœal process.

In most cases several joints are attacked at the same time, although it is not uncommon to see patients with only one joint involved.

The following table (Finger) gives the situation of the rheumatism in 375 collected cases:

	Times.
Knee-joint,	136
Tibio-tarsal joint,	59
Wrist-joint,	43
Finger-joint,	35
Elbow-joint,	25
Shoulder-joint,	24
Hip-joint,	18
Maxillary-joint,	14
Metatarsus,	7
Sacro-iliac joint,	4
Sterno-clavicular joint,	4
Chondro-costal joint,	2
Intervertebral joint,	2
Peroneo-tibial joint,	1
Crico-arytenoid joint,	1
	375

The joint-lesions consist ordinarily of a serous, sero-fibrinous or sero-purulent synovitis; rarely of a purulent synovitis.

Gonorrhœal synovitis usually begins with sudden pain and heat in the joint or joints, rise of temperature, chilly sensations and a feeling of general malaise. The urethral discharge at this time is usually very slight or absent.

Examination of the joint shows it to be distended with fluid, fluctuating and painful, the integument over it being reddened and hot. The severity of these symptoms varies according to the character of the exudation. If serous or sero-fibrinous, resolution usually occurs, leaving a good joint; if sero-purulent or purulent in character, there is more or less destruction of the articular surfaces, followed by ankylosis.

Accompanying gonorrhœal inflammation of the joints we sometimes see involvement of the eye, heart, bursæ, spinal cord, sheaths of tendons, fasciæ and muscles.

Gonorrhœal bursitis may attack any of the bursæ, but is usually observed in the bursa beneath the os calcis, or in the one in front of the tendo-Achillis, the lesion being the same as in synovitis.

The sheaths of the extensor tendons of the hand and fingers, the dorsal flexors of the toes, and the flexor pollicis, are the ones usually attacked, although it is not uncommon to see the sheaths of the biceps brachii and tendo-Achillis involved.

The palmar and plantar fasciæ are sometimes, although rarely, attacked.

The muscles generally, especially those of the neck, may be the seat of this gonorrhœal inflammation, which gives rise to pain and stiffness.

Diagnosis. The diagnosis may be readily made from the urethral discharge of threads in the urine, the time the rheumatism appeared, which is generally in the chronic stage of the disease, and the successive involvement of the large joints, such as the knee, ankle, wrist and shoulder.

Prognosis. The prognosis depends upon the degree

of inflammation, the number of joints involved, and the time the patient applies for treatment, the attack usually lasting from six to twelve weeks.

Treatment. If the lower extremities are attacked, the patient should be put to bed; otherwise he can be up and about with the part properly supported. The joint or joints are immobilized, and during the very acute stage covered with compresses wet in cold lead and opium wash; when the acute symptoms begin to subside the cold is stopped and the joint is blistered, or touched lightly with the Paquelin cautery, tincture of iodine being painted between the blisters or points that have been cauterized, after which firm and uniform pressure is exerted by means of a cotton dressing and proper splints. In the chronic stage the splints are removed, and the joints massaged or steamed and exercised daily, after which they are wrapped in iethyol or compound iodine ointment, the patient taking full doses of iodide of potassium, which is often of benefit at this time. If the fluid does not disappear under this treatment it must be withdrawn and the joint irrigated with 1–5000 bichloride of mercury solution in the usual manner.

If the inflammation goes on to suppuration with erosion of the articular surfaces and great deformity the joint will have to be resected to secure better position; this, of course, is not necessary until the disease has passed into the chronic suppurative stage.

The most important point in the treatment of gonorrhœal rheumatism is to cure all of the lesions situated in the urethra, as they are the points of entry of the infectious material.

If the gonorrhœa is acute, subacute or chronic the patient should receive treatment appropriate to these conditions. For the local pain, which in some cases is very severe, we are compelled to resort to the use of opium or morphine in a very guarded and careful manner, as it may have to be employed for some time.

Full doses of the oil of wintergreen or salicylate of sodium are apparently useful in some cases, although internal medication is as a rule of little value.

CHAPTER XVI.

STRICTURE OF THE URETHRA.

In order that the reader may clearly understand what stricture is, and how to detect and treat it properly, it is necessary to devote a few lines to the anatomy, calibre, length and shape of the urethra.

The male urethra is a collapsed canal or a continuous closed valve, whose surfaces, or walls, are always in contact, except during urination, ejaculation and the passage of instruments. It extends from the meatus urinarius externus to the bladder, which it joins at right angles.

It is made up of three layers, an internal or mucous layer, a middle or submucous connective tissue layer, and an external or muscular layer, which consists of circular and longitudinal fibers running from the bladder to the meatus, the circular or ring-shaped fibers being situated outside of the longitudinal ones.

Mucous membrane. The mucous membrane of the urethra is shining in appearance, yellowish pink in color, arranged in longitudinal and small transverse folds, and covered with flat pavement-epithelium for about the first quarter of an inch to one inch of its length, beyond which it is of the columnar variety as far as the bladder.

Penile or Pendulous Portion. On the roof or upper surface of the penile urethra about one-half to three-quarters of an inch from the meatus is the lacuna

magna, consisting of a valve-like reduplication of the mucous membrane, into which small instruments are apt to pass during urethral examinations. Situated principally in the roof or upper surface, but also in the floor or lower surface of the canal for about the first three or four inches of its length are the mucous follicles or glands of the urethra, with their orifices opening directly toward the meatus; these, if dilated, may also engage the tips of small examining instruments.

Bulbous portion. Opening directly on the floor of the bulbous portion of the urethra are the two orifices of Cowper's ducts, the glands themselves being situated between the anterior and posterior layers of the triangular ligament, and in the substance of the compressor muscle.

Membranous Portion. We next come to the membranous portion, which is surrounded by the compressor urethræ muscle and limited in extent by the anterior and posterior layers of the triangular ligament.

Prostatic Portion. The prostatic portion, situated, as it is, in the prostate gland, and extending from its apex to its base, presents the following structures upon its floor: running longitudinally in the median line is the verumontanum or caput gallinaginis, containing on its summit the uterus masculinus, in the walls of which are the openings of the common ejaculatory ducts. The prostatic ducts open into the prostatic sinuses, which are situated on each side of the verumontanum. It will, therefore, be seen that the seminal vesicles, testicles and prostate gland are in direct communication with this portion of the urethra by means of their ducts.

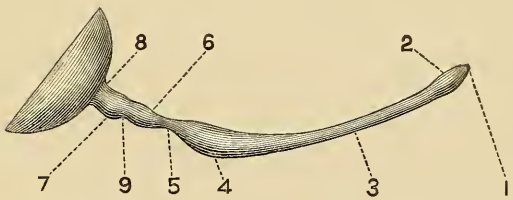
Length. The length of the urethra varies in differ-

ent individuals and under different conditions, the average being from seven to eight and one-half (7 to 8½) inches; this is increased in hypertrophy of the prostate gland and during erection of the penis. The following table from Sir Henry Thompson gives the approximate length of the different portions of the canal:

	Inches.
Penile or pendulous portion,	6½
Membranous portion,	¾
Prostatic portion,	1¼
Total length,	8½

Calibre. The calibre of the urethra is not uniform, but varies greatly in different individuals and in different portions of the same urethra, there being certain points of physiological contraction and dilatation, which points are well shown in Fig. 18, which was drawn from a plaster cast of the normal urethra.

Fig. 18.



Showing points of contraction and dilatation in a normal urethra.

1. Meatus urinarius,	21 to 28 French.
2. Fossa navicularis,	30 to 33 "
3. Middle of pendulous portion,	27 to 30 "
4. Bulbous portion,	33 to 36 "
5. Membranous portion,	27 "
6. Apex of prostatic portion,	30 "

7. Middle of prostatic portion,	45 French.
8. Base " " "	33 "
9. Indentation caused by verumontanum.	

Therefore, in examining a patient for stricture of the urethra the surgeon must bear in mind the fact, that the meatus urinarius, the middle of the pendulous portion, and the membranous portion, are normally narrower than the rest of the urethra, and also that the fossa navicularis, the bulb, and the middle of the prostatic portion, are larger and more dilatable.

Shape. The shape of the urethra varies greatly in the different regions of the canal, being vertical at the meatus and throughout the fossa navicularis, transverse in the penile, or pendulous urethra, and like an inverted Y in the middle of the prostatic portion, thus ⅄; this formation is due to the jutting up of the verumontanum from the floor of the prostatic urethra.

DEFINITION OF STRICTURE.

Various definitions of stricture have been given from time to time by different authors, the most prominent among them being that by Sir Henry Thompson, who says, "stricture may be defined as an abnormal organic contraction of some part of the urethral canal."

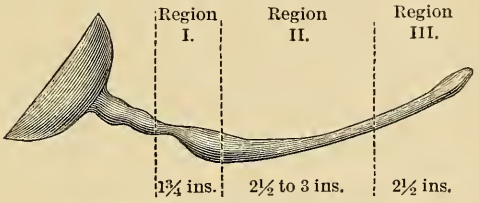
Sir Charles Bell speaks of stricture as "any loss of dilatability of the urethra."

Prof. R. W. Taylor defines stricture as "a condition of the canal attended by decidedly well-marked contraction or stenosis and an utter loss of normal dilatability, caused by an inflammatory process which produces a sclerosis of greater or less density and contractile power."

SEAT OF STRICTURE.

For conciseness and clearness of description we will follow the plan of Sir Henry Thompson, who divides the urethra into three regions, as follows: (See Fig. 19.)

FIG. 19.



Showing division of urethra into regions.

Region I. includes all of the membranous, and one inch of the bulbous urethra, and is therefore about one and three-quarter ($1\frac{3}{4}$) inches in length.

Region II. extends from the anterior limit of Region I. to within two and a-half ($2\frac{1}{2}$) inches of the meatus, its length varying from two and a-half to three inches ($2\frac{1}{2}$ to 3).

Region III. includes the first two and a-half ($2\frac{1}{2}$) inches of the canal from the meatus down.

In two hundred and seventy specimens examined by Thompson, three hundred and twenty strictures were found, their situations being as follows:

	Strictures.	Per cent.
Region I.	215	67
Region II.	51	16
Region III.	54	17

It will, therefore, be seen that the majority of gonorrhœal strictures occur at the bulbo-membranous junc-

tion, or Region I.; next in the region of the fossa navicularis, or Region III.; and least frequently in the middle of the pendulous urethra, or Region II.

Primary gonorrhœal stricture of the prostatic urethra has never been found, the changes in this portion of the canal being due to submucous cell-infiltration, which does not go on to true stricture-formation.

The reason for the so frequent occurrence of stricture in the bulb of the urethra and fossa navicularis is the fact, that in these regions the mucous membrane is lax and surrounded by a large amount of erectile and vascular tissue, which arrangement tends to prolong a gonorrhœal inflammation which has settled there, and which naturally results in more or less cicatricial contraction.

NUMBER OF STRICTURES.

In the majority of cases stricture is single, although there may be two, three or even four in the same case; this however, is not at all common. Out of the two hundred and seventy museum specimens of stricture, Thompson found the stricture to be single in two hundred and twenty-six cases.

TIME OF OCCURRENCE.

Urethral stricture, as a rule, comes on slowly, and in the majority of cases does not give rise to symptoms until several years after the initial attack of gonorrhœa; this fact is borne out by statistics, which show that the great majority of men apply for treatment between their twenty-fifth and fortieth years. There are cases, however, in which symptoms are observed as early as the sixth month after the urethral inflammation, which

goes to show that stricture-formation is in some cases very rapid.

The lesion in stricture of the urethra consists at first of a small, round-cell, exudative infiltration into the submucous connective-tissue layer; this is soft and yielding, and if sufficient in amount to cause any loss of urethral calibre it is called "soft" stricture. As the process advances, however, the small round-cells are replaced by connective-tissue cells, and we then have a fully formed dense "semifibrous" stricture, which causes more or less impairment of the urethral lumen, with loss of dilatability.

These cell-changes may be sharply limited to the submucous connective-tissue layer or involve the corpus spongiosum to a greater or less degree, giving rise to a peri-urethritis. The mucous membrane over the stricture becomes more or less thickened, and loses its smooth and shining appearance.

VARIETIES AND FORMS OF STRICTURE.

Linear Stricture. A linear stricture consists of one or more thread-like bands situated just beneath the mucous membrane and encircling the urethra to a greater or less degree.

Annular Stricture. An annular stricture consists of a broader ring of stenosis than the linear variety. If the narrowing involves an inch or more of the canal, we then speak of it as an irregular or tortuous stricture.

Diaphragmatic stricture consists of a fold of mucous membrane, with the opening, either large or small, situated in its center or side.

Crescentic or Bridle Stricture. In this form of stricture the mucous fold arises from either the roof, floor, or one of the urethral walls, and juts out into the canal.

Inodular Stricture. In this variety the lumen of the urethra is greatly contracted, and the canal is converted into an irregular mass of fibrous tissue.

Inflammatory stricture. The so-called inflammatory stricture is due to a temporary swelling of the mucous membrane covering any of the above forms of stricture, and is caused by alcoholic or sexual excesses, irritating urine, cold, bodily fatigue and unskillful instrumentation. It should, therefore, be looked upon as a complication, and not as a form or variety of true stricture.

Resilient Stricture. Resilient strictures are elastic, and therefore cannot be cured by dilatation, as after instruments are passed they rapidly contract several sizes, leaving the patient with a greatly reduced urethral lumen.

Spasmodic or Muscular Stricture. Spasmodic stricture is due to the sudden contraction of the compressor urethræ muscle, which surrounds the membranous urethra, or to the circular muscular fibers of the urethra itself. It occurs most frequently in nervous, irritable and excitable subjects. The spasm may be caused by the rapid or unskillful passage of urethral instruments, operations on or diseases of the rectum and anus, highly acid urine, the long retention of urine, sudden exposure to cold, or, in some cases, from a feeling of shame or fear, as when patients are unable to pass their urine before a class or even in the presence of the examining surgeon.

CAUSES OF STRICTURE.

The great majority of cases of urethral stricture are due to gonorrhœa, or urethritis. In two hundred and twenty cases of stricture reported by Sir Henry Thompson, seventy-five per cent. were due to gonorrhœa.

Traumatic stricture is usually single, and may occur in any portion of the urethra, depending on the seat of injury, but in the vast majority of cases is found in the bulbous or membranous portions or at the bulbo-membranous junction; in these regions it follows falls or blows upon the perineum, causing more or less laceration of the urethra, either with or without fracture of the pelvis.

Congenital stricture is sometimes observed, especially at the meatus, or just beyond it in the anterior portion of the canal.

Stricture may also result from the healing of sores situated within the urethra or at the meatus.

SYMPTOMS OF STRICTURE.

The symptoms of stricture vary greatly in different cases, their severity depending upon the degree of contraction of the strictured area. As a rule, there is more or less gleety discharge from the meatus, which may amount to a drop or so in the morning, or only to a gluing together of the meatus; in other cases, however, there is no gleet, but if the urine be examined, it will be found to contain threads and flakes which are made up of pus and epithelial cells. The meatus is often quite blue in color from the congestion caused by the cicatricial tissue around the urethral walls, which interferes with the return circulation. In old cases of

tight stricture the urine may be quite cloudy from the presence of pus which arises from the urethra and bladder. As the stricture contracts there is more or less dilatation of the urethra behind it, caused by the damming back of the stream at each act of urination; this mechanical irritation in time causes congestion and inflammation of the urethral mucous membrane from the posterior surface of the stricture up to and, in some cases, into the bladder, so that these patients really have posterior urethritis with more or less urethro-cystitis, which gives rise to an increased frequency in urination, which may be preceded, accompanied or followed by a varying amount of pain and uneasiness in the urethra, perineum, prostate and testes. As the stricture contracts the muscular walls of the bladder hypertrophy from the extra amount of pressure they are compelled to exert in order to empty the viscus through the stenosed canal. The urine now comes with less force, and cannot be thrown any distance from the meatus; in severe cases it comes in scalding, blood-stained drops, which can only be expelled by severe and long-continued straining; this may cause either hernia, hemorrhoids or prolapse of the rectum, and be associated with evacuation of the bowel at each attempt at urination. From the inflammation in the prostatic urethra and around the verumontanum these patients may have either painful erections or nocturnal pollutions, or, if the inflammatory process involves the ejaculatory ducts, epididymitis or epididymo-orchitis. Some cases at this time have a constant dribbling of urine from the meatus, this incontinence being due to a loss of contractile power of the vesical sphincters.

Retention of urine may occur at any time during the course of stricture-formation; in some cases it is the first symptom that calls the patient's attention to his real condition; it is due to a sudden swelling of the mucous membrane covering the stricture, caused by irritating urine, over-zealous instrumentation, catching cold, sexual or alcoholic excesses, etc., some patients being more prone to this complication than others. If the cystitis is well marked, patients complain of constant and deep-seated pain over the bladder. The urine in some of these advanced cases becomes ammoniacal (from decomposition of the urea), bloody, and loaded with crystals and pus, which, being coagulated in the bladder by the ammonia, causes a ropy and gelatinous condition of the urine, which is liable to obstruct the eye of the instrument during catheterization. If the above condition of the urine is not modified by proper treatment it may result in stone-formation.

COMPLICATIONS OF STRICTURE.

That portion of the urethra situated behind the stricture, as already stated, becomes dilated to a greater or less extent and its mucous membrane and connective-tissue layer become much thickened; the orifices of the prostatic sinuses and the ejaculatory ducts which are situated in the floor of the prostatic urethra are also dilated; these changes are all produced by the back pressure of the urine, whose free outward passage is prevented by the stenosed and thickened canal. Abscesses and fistulæ may form behind the stricture, originating in inflamed urethral follicles or ulcerated spots into which the urine escapes, and finally burrows

in fistulous tracts, which may open in the perineum, on the buttocks, scrotum or the abdomen.

In some severe cases abscess of the prostate occurs, which, if untreated, may rupture either into the urethra, perineum or rectum. The bladder walls become greatly thickened from hypertrophy of the muscular layer, which causes trabeculæ of muscular tissue to project into the viscus; between these ridges the bladder-wall becomes very thin and dilated, going on to the formation of sacculi, which may in time rupture and allow the contents of the bladder to escape into the peritoneal cavity. Following these changes in the bladder the ureters become dilated, as do the pelves of the kidneys, the secreting portions being pushed out and compressed by the accumulated urine. The inflammation ascending from the bladder through the ureters finally enters the pelves of the kidneys, causing pyelitis, with all of its concomitant symptoms.

EXTRAVASATION OF URINE.

The urethra behind the stricture having become thin and weakened may, as the result of violent straining, or without apparent cause, give way and allow the urine to escape into the surrounding tissues in greater or less amount. Rupture of the urethra may occur in any of the following regions, depending, of course, upon the site of the stricture:

1. Between the meatus and the peno-scrotal junction.
2. Between the peno-scrotal junction and the anterior layer of the triangular ligament.
3. In the membranous urethra; that is, between the anterior and posterior layers of the triangular ligament.

4. Behind the posterior layer of the triangular ligament.

It is, of course, possible for two of these regions to be included by the rupture of the urethral wall at the same time.

Symptoms. The local symptoms depend on the point of rupture, and will be described later. The constitutional symptoms are as follows: The patient sometimes experiences a sudden sensation as if something had given away in some part of the urethra; this is followed by a feeling of momentary relief, accompanied by swelling of the penis, hypogastrium, scrotum or perineum, according to the locality of the rupture. The skin, which at first is very tense, bright red in color, and shining in appearance, soon becomes gangrenous, sloughing and emphysematous from the presence of the gases situated beneath it, which are produced by the decomposing urine extravasated through the tissues.

It is a well established fact that normal urine does not cause gangrene or destruction of the tissues even when injected beneath the integument in considerable quantities.

The patient at this time has fever, with chilly sensations or well-marked chills and a feeling of general malaise.

The local symptoms, as already stated, vary according to the point of rupture, and are as follows:

When the opening in the urethra occurs between the meatus and the peno-scrotal junction the extravasation takes place into the tissues of the corpus spongiosum, pushing forward into the glans penis and causing great swelling of the organ.

When the rupture occurs between the peno-scrotal junction and the anterior layer of the triangular ligament the urine is extravasated into the scrotal tissues and upward on the hypogastrium, sometimes as far as the umbilicus.

When the rupture takes place between the anterior and posterior layers of the triangular ligament (in the membranous urethra) the urine is at first confined between these layers, but soon makes its way backward into the pelvic cavity, or, in exceptional cases, burrows forward into the perineum.

When rupture takes place behind the posterior layer of the triangular ligament the urine passes either into the recto-vesical space, and thus works down to the perineum, or passes upward into the pelvic tissues.

Treatment. No matter how great or small the amount of extravasated urine is, we must always bear in mind the clinical fact that it is due to a constant leakage of urine through a more or less damaged urethra, and that in order to check it the bladder must be promptly drained through the perineum. This must be done without delay, as the longer it is put off the greater the extravasation becomes, which, if left uncontrolled, means abscess-formation, or sloughing and gangrene of the soft parts, with more or less absorption of septic material.

The patient, having been etherized, is put in the lithotomy position, and the parts shaved and rendered surgically clean in the usual manner. External urethrotomy or perineal section is then performed, according to the manner described under perineal operations for bladder drainage and stricture of the urethra. All of

the stricture-tissue having been thoroughly divided a large perineal tube is passed into the bladder and secured in the usual manner. By free and deep incisions all of the extravasated urine must be liberated, the sloughy and gangrenous tissues removed, and bleeding points controlled. The incisions are thoroughly irrigated with hot-salt solution, and lightly packed with iodoform or sterilized gauze.

The incisions are kept scrupulously clean by frequent irrigation and dressing, and treated on general surgical principles.

If urinary abscesses or fistulæ exist, they must be freely opened, scraped, resected and drained at the time of the perineal operation.

CHAPTER XVII.

DIAGNOSIS OF STRICTURE.

In order to ascertain the presence of stricture, its situation, consistency and calibre, the following instruments are necessary :

Filiform and olivary bougies, bougies à boule, steel sounds, a scale plate and measure combined, and for certain selected cases an Otis urethrameter.

The scale plate, as well as all of the urethral instruments, should be made and marked according to the French scale, which runs as follows :

No. 1 French = $\frac{1}{3}$ of a millimeter in diameter.

No. 2 French = $\frac{2}{3}$ of a millimeter in diameter.

No. 3 French = 1 millimeter in diameter.

Thus it will be seen that each instrument increases in size by one-third of a millimeter in its diameter.

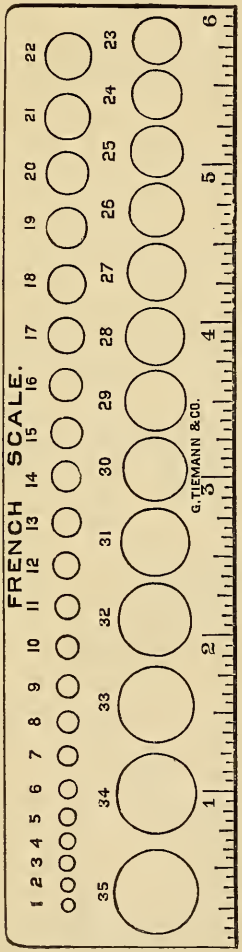
Scale Plate. The scale plate or gauge is made of nickel-plated steel, with numbers or sizes running from No. 1 to No. 35, or even 40 French, inclusive. (See Fig. 20.) One edge is marked in inches like a rule, so that it can be used for measuring the distance from the meatus at which instruments are stopped by stricture.

Sounds. Sounds are made of smooth, highly polished nickel-plated steel, and should run from No. 18 to No. 35 French, inclusive. They should have the Thompson curve and conical point, which is three sizes smaller than the shaft. (See Fig. 21.)

Olivary bougies. The French olivary bougies are the most durable, although quite good ones are made in

this country; they are black or yellow in color, with a very smooth and highly polished finish. (See Fig. 22.)

Fig. 20.



Scale plate.

Fig. 21.

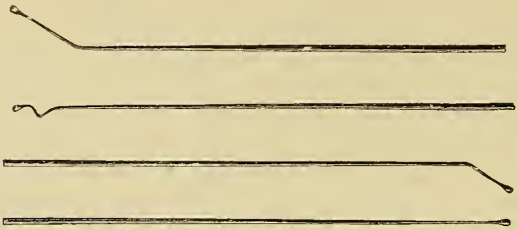
Curved steel sound.

Fig. 22.

French olivary bougie.

The shaft tapers gradually into the neck, which terminates in the olivary end, this being about seven sizes smaller than the shaft. These bougies must be

FIG. 23.

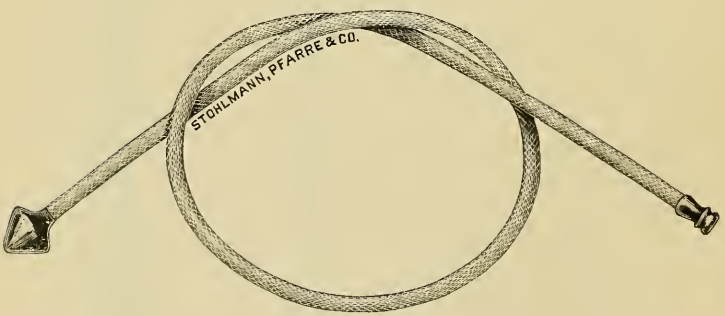


Gouley's whalebone filiform bougies.

flexible, so as to adapt themselves to the curves of the urethra, and should run from No. 3 to No. 20 French, inclusive.

Filiform Bougies. Gouley's whalebone filiform bougies are the best. (See Fig. 23.) They are twelve

FIG. 24.



Bougie à boule.

inches long and about Nos. 1 to 3 of the French scale in size; the shaft must be smooth and polished, and

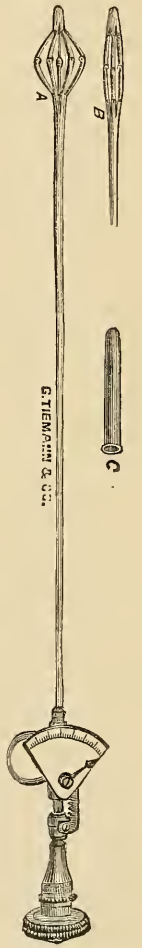
terminate in a tiny bulb. The points of some of the instruments may be turned and twisted in various ways, in order to facilitate their entrance into irregular contractions. The remainder however should be made straight, and in my hands are really the most useful for cases of tight stricture. The surgeon should have a dozen at least.

Bougies à Boule. These instruments should be soft and flexible, as is well shown in Fig. 24. Those made of metal cause more pain, and do not give the examiner as good an idea of the condition of the urethral walls. The shoulder of the bulb should be well marked and smooth. It is best to have a set of these bougies from No. 8 to No. 32 French, inclusive.

The Urethrameter. The Otis urethrameter, if skilfully used, is a very valuable instrument for detecting and locating strictures in cases with abnormally small meati. If, however, the little bulb is screwed up too high and then withdrawn, there is great danger of mistaking physiological contractions of the urethra for true strictures.

The instrument (See Fig. 25) consists of a No. 8 French straight canula, terminating in a bulb made up of short arms, which can be dilated (*A*) and contracted (*B*) by means of a rod run-

FIG. 25.



Otis urethrameter.

ning through the canula and terminating in a screw at the handle of the instrument. A thin rubber shield (*C*) is drawn over the metallic bulb to protect the urethra from injury. The index on the handle shows the size in millimeters to which the bulb has been dilated or contracted. The bulb when closed is about No. 18 French, but can (although it never should) be expanded up to No. 40 or 45 of that scale by turning the screw at the handle, which indicates at the same time the increase in size on the index.

METHOD OF EXAMINATION.

Before exploring the urethra with instruments the surgeon should ascertain the date of the gonorrhœal infection as well as its duration, severity and complications, as these points will throw much light on the patient's present condition. If there is a muco-purulent or purulent urethral discharge, with swelling and redness of the meatus, the patient must be put on appropriate treatment, and instrumentation deferred unless imperative until the acute symptoms have subsided. As a rule, examining instruments ought not to be passed into the urethra until at least three months after the last gonorrhœal attack. Inquire into the frequency of urination during the day or night; if it is painful or causes uneasiness in the region of the prostate; also, if there is any morning discharge or sticking of the lips of the meatus. Ask if there is a dribbling of urine after urination, or any change in the character, force or size of the stream. Have the patient pass his urine at the *time of his visit* in a glass cylinder; this is carefully examined for gonorrhœal shreds, pus or mucus, as

these elements, by their presence in the urine, together with a history of the case, will give a clear idea as to the extent and severity of the urethral or even bladder inflammation.

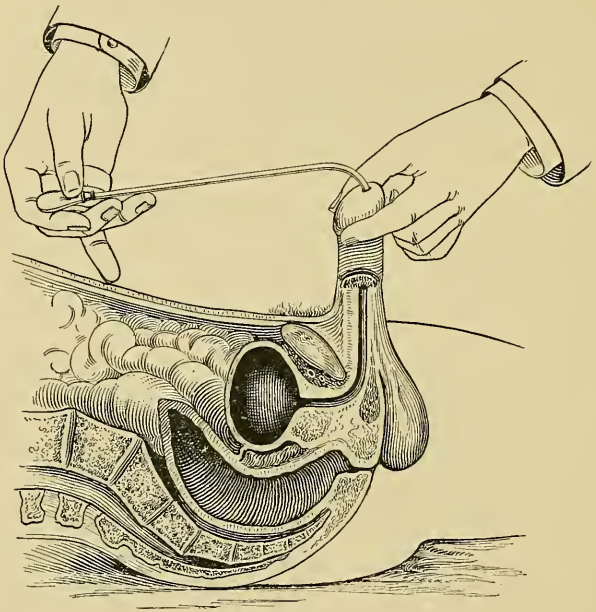
URETHRAL EXPLORATION.

The following rules should be carefully carried out in making all urethral examinations or explorations, no matter what kind of instruments are being employed. Large instruments should always be used first, as small ones are more apt to irritate the urethra, and thus cause spasm, which interferes greatly with further examination. If instrumentation causes bleeding, it should be stopped immediately, and not be repeated for a day or so, appropriate treatment being employed in the meantime.

The patient having urinated in order to wash out any secretion that may have collected in the urethra, lies down on an operating table, with head and shoulders slightly elevated on a pillow or cushion ; in this way relaxing the belly muscles, and the suspensory ligament, which runs from the symphysis pubis to the dorsum of the penis. The clothing should be drawn down as far as the knees and up to the umbilicus, as by so doing the instrument can be readily depressed between the thighs as it enters the bladder, and at the same time we can note the median line by the position of the umbilicus and the linea alba. The glans penis and meatus should be carefully wiped off with warm water or a little bichloride solution, and the prepuce well retracted, so that the penis can be held in the sulcus, which will prevent it slipping from the examiner's fingers.

For exploring the urethra for stricture, the best instrument to use is the flexible bougie à boule, selecting one that will readily enter the meatus. It is washed in soap and warm water, dried on absorbent gauze, and lubri-

FIG. 26.



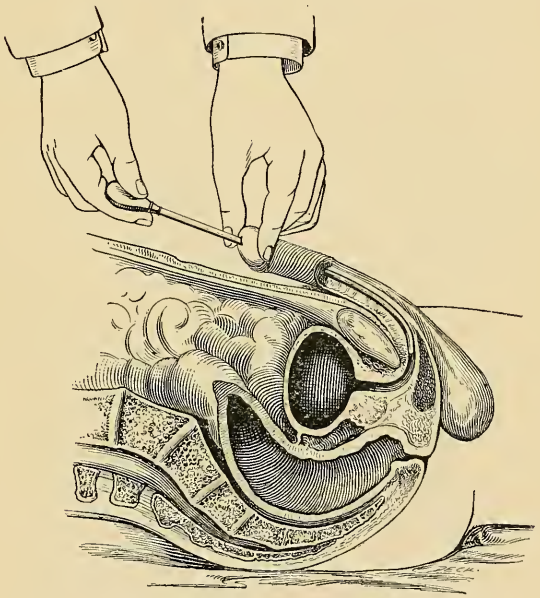
Sound entering meatus.

cated with plain white vaseline. The penis is held at right angles to the body by means of the thumb and index finger of the left hand, which grasps it in the sulcus behind the corona. As the bougie, held lightly between the right thumb and forefinger, *glides slowly and gently* down the canal it imparts to the examiner an accurate idea of the condition of the urethral walls :

whether they are inelastic and rigid, soft and pliable, or the seat of contraction.

If preferable, the exploration may be made with a steel sound, or olivary bougie, selecting one that enters the meatus with ease; it is washed in soap and hot water, dried on absorbent gauze, lubricated with plain white vaseline, and passed *slowly* and with the *utmost care* and *gentleness* in the following manner:

FIG. 27.

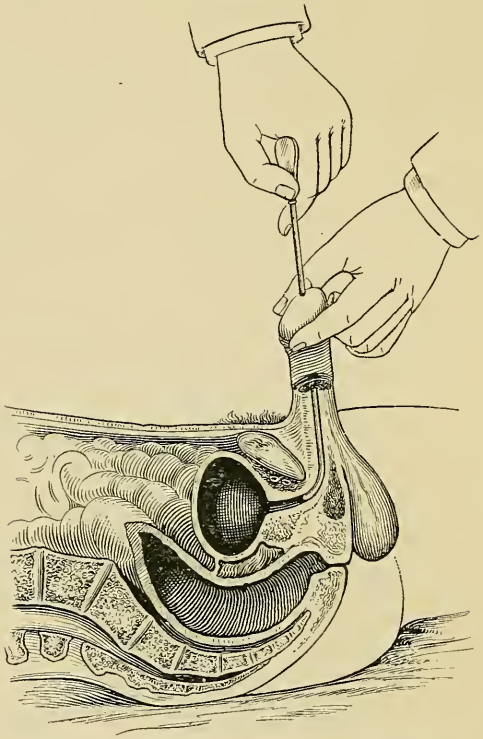


Tip of sound entering bulb.

The operator stands on the left side of the patient, holding the penis in the coronal sulcus, between the thumb and index finger of the left hand; in this way the penis is put on the stretch at right angles to, and

in the median line of the body; thus effacing the first curve of the urethra. The sound is held *lightly* between the thumb and first two fingers of the right hand, which

FIG. 28.



Tip of sound at the opening in triangular ligament.

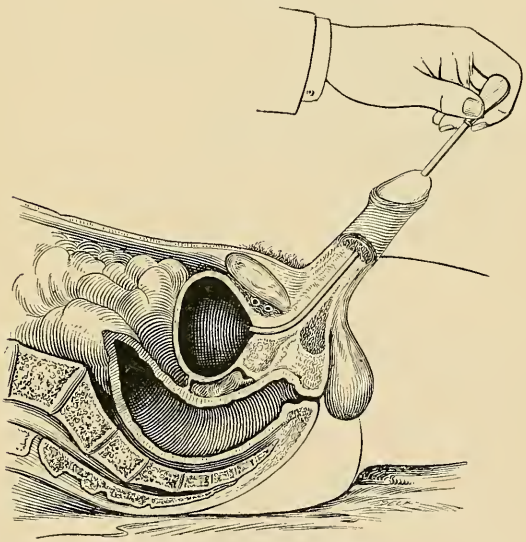
rests on the median line of the belly wall, and the tip of the instrument is *gently* inserted into the meatus. (See Fig. 26.)

The hand still resting on the abdominal wall, urges the sound *gently* downward into the urethra, the penis

at the same time being drawn upward, so that the surgeon's hands approach each other. (See Fig. 27.) At this time the tip of the sound is just entering the bulb. The left hand now drops the penis, which is swept slowly downward and at right angles to the body by the sound, whose tip now rests against the opening in the triangular ligament, and its convexity in the bulb of the urethra. (See Fig. 28.)

In order to reach the prostatic portion the handle of the instrument is gently depressed, it being now held in the left hand. (See Fig. 29.) The patient usually

FIG. 29.

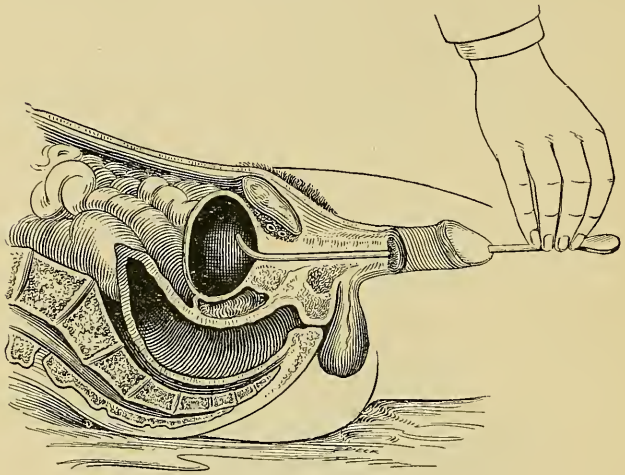


Sound in prostatic urethra.

complains at this time of a desire to urinate, owing to the pressure of the instrument on the mucous membrane

of the prostatic urethra, which is extremely sensitive, even in health. If the bladder is to be explored, the handle of the sound is depressed still further between the thighs and pushed gently upward, when it will be felt to glide easily into the bladder. (See Fig. 30.)

FIG. 30.



Sound in bladder.

Endoscopic tubes, cystoscopes, stone searchers, lithotrites, evacuating tubes, and in fact, all instruments used in the deep urethra and bladder, are introduced in the same manner as above described.

In examining old men the tip of the instrument will sometimes catch or hitch in the bulb, as in these cases it is often in a more or less relaxed and sacculated condition, and is easily carried on the tip of the sound for a short distance upward and beneath the membranous urethra. This complication can be easily obviated by

keeping the end of the instrument in close contact with the roof of the canal.

While the sound or bougie is still in the urethra much information can often be obtained by palpating the canal against it, as in this manner thickened patches on the floor of the urethra or strictured areas can be felt.

If the olivary bougie or sound detects a stricture we should then employ a flexible bougie à boule in order to ascertain its exact location and calibre. It is washed in soap and warm water, dried, lubricated with vaseline, and passed in the same manner as the olivary bougie down to the obstruction, the distance down being noted by holding the finger on the shaft of the instrument at the meatus; it is then withdrawn, when the distance between the finger and the bulb is measured, which gives the exact depth of the contraction in inches. Smaller bougies à boule are tried until one finally passes the obstruction which, of course, gives its calibre or size.

If the stricture is so tight that it will not admit our smallest olivary bougie, or bougie à boule, we then employ whalebone filiform bougies. In passing filiforms it is best to hug the floor of the urethra with the penis on the stretch and at right angles to the body, so as to avoid the lacuna magna on its roof, in which these little instruments often catch. The tip of the instruments may be left straight, or turned and twisted in various ways and shapes, as already shown. The urethra having been fully injected (distended) with warm olive oil if so desired, a filiform is passed down to the face of the contraction, and rotated slowly and carefully until it engages in the opening, when we make a diagnosis of filiform stricture; if this does not occur

we pass another filiform, and so on, until one finally enters the opening in the contraction, when it is left in situ and the others removed, or, if this is impossible, we speak of it as an impassable stricture; that is, it may be impassable to instruments, and yet the urine can be voided in drops or even in a fair-sized stream.

If the patient has such an abnormally small meatus that it will not admit bougies or sounds of a sufficient size to examine the urethra properly, and if it is not thought wise to enlarge the meatus at the time by meatotomy, then we may employ for exploratory purposes the Otis urethrameter in the following manner: It is cleansed, lubricated with plain white vaseline, gently passed into the bulb, and screwed up to about No. 28 or 30 of the French scale. As the instrument is slowly withdrawn the stenosed areas or spots of thickening are noted, great care being taken not to diagnose physiological contractions as strictures of the urethra.

CHAPTER XVIII.

TREATMENT OF STRICTURE.

The treatment of urethral stricture depends greatly upon its situation, duration and extent, and whether it be soft, semifibrous or inodular. As a broad, general rule, however, it may be stated that the best routine treatment is gradual dilatation with bougies and sounds combined with local urethral and internal medication. If these methods fail or cannot be employed, we then resort to one of the cutting operations about to be described.

The urine should be carefully examined in order to ascertain the condition of the kidneys, and at the same time the extent and severity of the urethral and bladder inflammation, if these conditions exist.

If the patient has urethritis, or cystitis, it must be treated in the manner already given for these affections, to which the reader is referred. Kidney disorders are to be handled on general medical and surgical principles. The reaction of the urine must be modified either by the administration of acids or alkalies, as indicated, and the patient's diet carefully looked into and regulated, so that we may render the urine as bland and non-irritating as possible.

STRICTURES OF OR WITHIN THE MEATUS.

Strictures in this situation do not yield to dilatation and must therefore be cut (meatotomy). The normal meatus varies from No. 21 to 28 French, and should

never be interfered with unless absolutely necessary, as over-zealous cutting of this part of the canal leads to a flat spluttering stream that cannot be thrown any distance from the body, and a disagreeable dribbling of urine after each act of urination. If the meatus is so small that normal urination is interfered with, or that proper treatment cannot be applied to the parts beyond, then it may be cut up to No. 28 or even 32 of the French scale, according to the case.

MEATOTOMY.

The patient urinates and lies on his back ; the parts are cleansed, as is also the urethra, by irrigations of warm boric-acid solution. Local anæsthesia may be caused by injecting a little 4 per cent. cocaine solution, which produces its full effect in about ten minutes. The prepuce is retracted and the penis grasped in the sulcus behind the corona ; then, with a straight, blunt bistoury, the meatus is slowly incised downward on its floor and directly in the median line to the desired size. Contractions just beyond are dealt with in the same manner, except that a little cutting may have to be done in the median line of the roof of the urethra ; this fact having been ascertained at the time of the first examination. A steel sound is then passed through the meatus to see that all is clear, and repeated daily to prevent contraction of the little wound. If bleeding occurs it can be readily controlled by pressure and a light gauze dressing.

STRICTURES OF THE PENILE URETHRA.

Strictures of the penile urethra include all of those contractions which are situated between the meatus

and the junction of the penis with the scrotum. If these contractions are soft and yielding, gradual dilatation should be tried with the olivary bougie or steel sound. If dilatation causes pain or irritation, and it is found impracticable, it should be stopped and the stricture cut (internal urethrotomy) either with a straight blunt bistoury if near enough to the meatus or with a urethrotome if further down the canal. For a description of internal urethrotomy the reader is referred to page 127. The incision with the bistoury is made directly in the median line and on the roof of the urethra. A No. 28 to 30 French steel sound is then passed, and the divided contraction kept open by passing sounds every few days until the wound is healed, when the intervals between instrumentation can be made much longer. The urethra should be cleansed, anæsthetized and irrigated, as already described under meatotomy.

STRICTURES BEYOND THE PENO-SCROTAL JUNCTION.

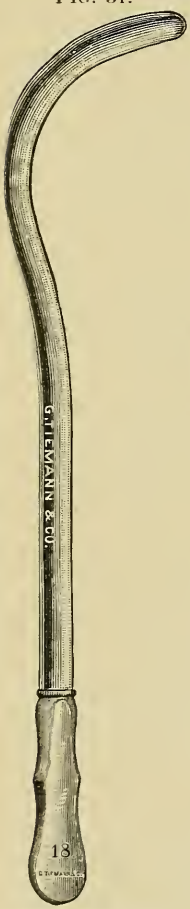
For strictures situated in the bulbous portion of the urethra, or at the bulbo-membranous junction, if they are soft or even semifibrous, we should always try gradual dilatation and local urethral medication before resorting to any cutting operation.

GRADUAL DILATATION.

Gradual dilatation consists in passing olivary bougies, if the stricture is under No. 18 French, or steel sounds, if No. 18 French or over, every fifth or seventh day, depending on the reaction and results obtained; these can be noted by the patient's sensations and the appear-

ance of the urine, which should be examined at each visit. The dilating instrument is passed slowly and gently and left in the urethra for a minute or so, in this manner exerting pressure on the thickened and infiltrated urethral walls, which in many cases resume their normal consistency as the result of the absorption of the inflammatory material.

Fig. 31.



Benequé steel sound.

The size of the bougies or sounds must be increased slowly and in the following manner: if a stricture takes a No. 15 French at the first visit the surgeon should pass a No. 15 and 16 at the second visit, and so on until he has reached No. 28 or 32 of the French scale.

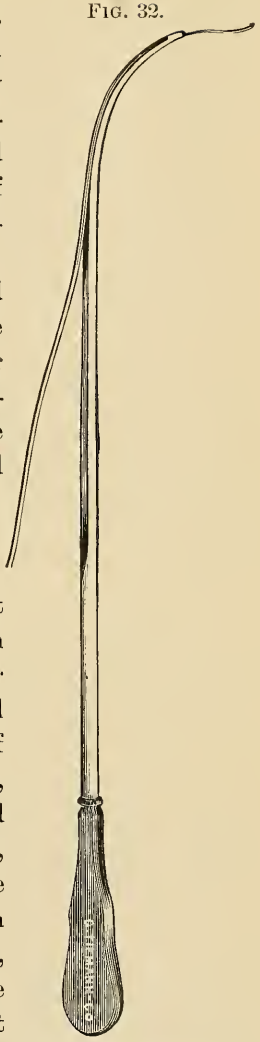
If the contraction is tortuous or irregular, and involves a considerable portion of the bulb, very satisfactory results will be obtained from the use of the Benequé steel sound (See Fig. 31), as by its double curve it exerts more pressure on the stenosed and thickened urethral walls.

By the careful employment of gradual dilatation many cases of even filiform stricture may be dilated up to No. 30 French and over, as the case requires, and kept so for the remainder of the patient's life, provided he will have a sound passed a few times during the year.

If the surgeon is too hasty, rough, unskilful or uncleanly in his urethral manipulations he may cause such complications as urethritis urethro-cystitis, urethral chills and fever, or retention of urine from swelling of the urethral mucous membrane.

If, after a fair trial, gradual dilatation fails we will then have to resort to urethrotomy, either external, internal or a combination of both, depending on the seat and extent of the strictured area.

FIG. 32.



Gouley's tunnelled sound and guide.

RAPID DILATATION.

If the stricture will only admit a filiform bougie it may be left in place and used as a guide for a small Gouley's tunnelled sound (See Fig. 32), which consists of a grooved, conical steel sound, the groove terminating in a canal or tunnel at its vesical extremity, through which the filiform guide passes. These sounds should run from about No. 6 to 18 French, inclusive, and must be well made so that the tunnel will not cut the filiform bougie as it passes through it. The sound is passed

over the filiform and through the stricture, which can in this manner be dilated through several sizes at one sitting, the subsequent dilatation being carried out with bougies and sounds.

This method of rapid dilatation is in reality a form of divulsion, and is attended with risk, even in the most skilful hands, and is not to be employed except in an emergency, and unless the patient can remain in bed, with proper constitutional and local treatment.

DIVULSION.

The treatment of stricture of the urethra by rupture or divulsion is purposely omitted, as it is considered dangerous, inexact and rough, as compared with gradual dilatation and the various forms of urethrotomy.

ELECTROLYSIS.

The treatment of stricture by this method is still so incomplete and wanting in results that nothing definite or authoritative can be stated at present. Professor Fort, of Paris, has done very satisfactory work in this line, his apparatus and instruments being most complete; the operation is of short duration, and so painless that no anæsthetic is required. Carefully observed cases for a sufficient length of time will alone give us the real worth (if any exists) in this method.

URETHRECTOMY.

By urethrectomy is meant either the partial or complete excision of all of the stricture tissue at the time of the external urethrotomy, and the building up of a new urethra, sutured about a retained catheter or tube.

This method should be reserved for those rare and exceptional cases of traumatic stricture that will not yield to simple external urethrotomy.

INTERNAL URETHROTOMY.

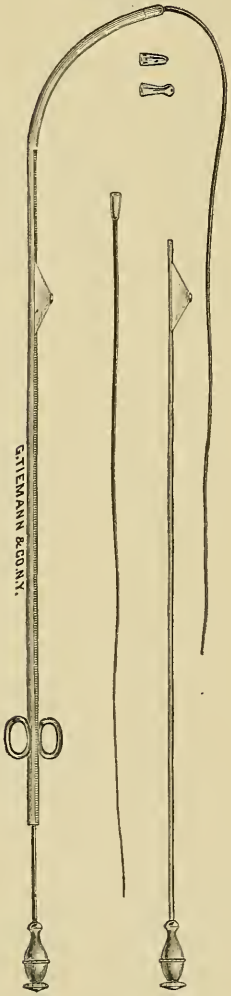
This operation consists of the division of the stricture within the urethra, the incision being made on the roof of the canal and directly in the median line, thus producing a linear wound. When the operation is properly performed there will be no danger of wounding either of the corpora cavernosa, as the little cut is situated below and between them, in the base of the septum pectiniforme.

As a broad, general rule, internal urethrotomy should be limited to undilatable strictures situated in the pendulous urethra and not further down the canal than four or five inches from the meatus, unless it is combined with external urethrotomy for the purpose of properly draining the bulb.

Instruments for Internal Urethrotomy. Instruments for this purpose are called urethrotomes, of which there are many forms and varieties. The surgeon should have two or three of these instruments, as no single one is adapted to all forms of stricture.

Maisonneuve's urethrotome (See Fig. 33) consists of a small grooved shaft with a short curve. The groove carries the knife, and is situated on the upper surface of the staff, stopping at the point where the curve begins. The distal end of the staff has a screw tip, to which may be attached a filiform guide, tunnelled, or solid tip. The knife, fastened to a long stylet, is triangular in shape, sharp in front and behind,

FIG. 33.



Maisonneuve's urethrotome.

FIG. 34.

Maisonneuve-Fluhrer urethrotcme.

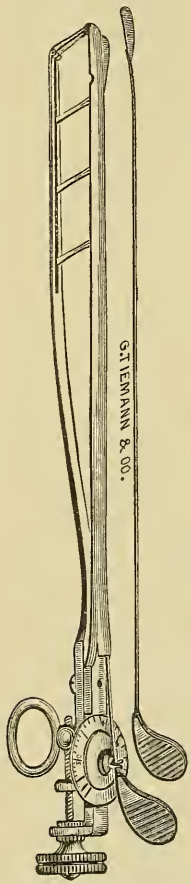
but blunt at its apex, so as not to cut the healthy urethra. The instrument is used as follows: the staff, with its solid tip, is passed into the bladder and held firmly in the median line of the penis, which is pulled forward on the stretch; the knife is then slipped into the groove and pushed down, cutting the contractions before it, when it is withdrawn, the penis and staff being held in exactly the same position. If the staff cannot be introduced alone, it can be screwed to the filiform, which it will follow, or passed over a long whalebone filiform bougie threaded through the eye in the tunnelled tip.

The Maisonneuve-Fluhrer urethrotome (See Fig. 34) consists of a straight No. 12 French grooved staff, the groove for the knife being situated on the upper surface of the instrument and terminating in a tunnelled tip, which is slightly curved upward. The knife is like the Maisonneuve and cuts to about No. 24 French. A whalebone filiform bougie is passed into the bladder and its end slipped through the tunnelled urethrotome, which is introduced over it through the stricture. The penis is held on the stretch in the median line, the knife pushed down the groove, and the stricture cut from before backward. This instrument is especially useful for tight strictures in the penile urethra.

The Otis urethrotome (See Fig. 35) is a dilating and cutting instrument combined. It consists of two steel shafts, which, when closed, are about No. 16 French; these shafts are connected by short bars like a parallel ruler, which can be opened or closed by means of a screw at the handle of the instrument, which at the same time indicates the calibre to which they are opened

on a little index. The blade running in a groove in the upper bar becomes concealed in a slot when it reaches its extremity.

Fig. 35.



Otis urethrotome.

The instrument, with blade concealed, is passed just beyond the stricture and gently and slowly dilated until the stricture feels tense, when the blade is drawn out, cutting through the stricture on the roof of the canal in the median line, and from behind forward. The blade is then pushed back and concealed, the shafts approximated, and the instrument withdrawn.

This urethrotome is serviceable for strictures of the pendulous urethra with a calibre of No. 16 French or over, provided that the urethra is not overdilated and unnecessarily cut.

Preparation of the Patient. Internal urethrotomy having been decided on, the urine must be examined in order to ascertain the condition of the kidneys and whether the bladder or urethra is the seat of inflammation. If diseased conditions exist they must be treated on the lines already laid down. The patient is put to bed for twenty-four hours before the operation and his general condition carefully attended to in every detail. Coffee and alcohol in all forms must be stopped and the urine rendered bland by a light nutritious diet and boric acid or alkalies, as

indicated. There is no better tonic than strychnine and quinine given in quite full doses before and after these operations. The bowels should be freely opened. If the kidneys will not allow of ether, the urethra may be anæsthetized with a little four per cent. cocaine solution.

Operation. The patient having urinated, is etherized, the pubes and genitals are shaved and rendered surgically clean in the usual way. If possible, the urethra and bladder are thoroughly irrigated with warm boric-acid solution by means of a hard-rubber hand-syringe and catheter, and the cutting performed with one of the instruments already described, which has been scrubbed, sterilized and placed in warm boiled water. After the urethrotome has been taken out a bougie à boule, or steel sound, properly cleaned and lubricated, should be passed, to see that no bands or constrictions are left, after which the urethra and bladder are again irrigated with warm boric-acid solution, several ounces of which are left in the bladder with the idea of diluting the urine and rendering it less irritating as it is voided over the wound in the urethral wall. The operation being completed an opium suppository is placed in the rectum, and the patient put to bed, with a light sterile gauze dressing around the penis. The stricture having been cut up to No. 25 or 30 French is kept open by dilatation, which is begun on about the second day after the operation, and continued as already described. If internal urethrotomy is performed in this conservative manner we will not have such unnecessary complications as severe hemorrhage, urethral chills and fever, and permanent curvature of the penis. In this operation, no matter what instru-

ment is used, it should always be held firmly in the median line, and the penis pulled out over it and well on the stretch, so that the incision will be as nearly as possible in the medium line, thus avoiding injury of the corpora cavernosa, with subsequent hemorrhage.

EXTERNAL URETHROTOMY.

For strictures situated deeper than four to five inches from the meatus, that is, in the bulbous, the bulbo-membranous or membranous portion, we should perform either a combination of internal and external urethrotomy, or external urethrotomy alone: the object of the external cut being to drain the bulb properly through the perineum, and in this manner prevent the accumulation and absorption of any irritating or infectious secretion that might occur.

The following perineal operations are for bladder drainage and for the relief of strictures of the bulbous, the bulbo-membranous and membranous portions. The preparation of the patient and the instruments for all of these operations is the same, and to prevent repetition will be described here, and not with each special operation.

Preparation of the patient. The condition of the kidneys is carefully looked into, and if disease exists it must be treated on the usual medical or surgical lines. The patient goes to bed for a day or so before the operation, and his general health is put in as good condition as possible by a light, nourishing diet and tonics, such as strychnine and quinine. Alcohol and coffee must be stopped, as they cause more or less urethral and bladder irritation.

If possible, the bladder and urethra should be irrigated daily with warm boric-acid solution for several days before the operation. The bowels are kept open.

The patient, being etherized, is placed in the lithotomy position on the extreme end of the table, and in a good light, and held there flat on his back and exactly in the median line by assistants or appropriate apparatus. The symphysis, scrotum and perineum are shaved and rendered surgically clean in the usual manner, as are also the penis and preputial cavity.

The urethra and, if possible, the bladder are flushed out with warm boric-acid solution by means of a catheter and an Ultzmann hard-rubber hand-syringe or irrigator; if the bladder can be entered, it should be left partially filled with the solution.

All metal instruments must be sterilized and placed in trays of hot boiled water; the soft ones are carefully washed in soap and hot water, and laid in sterilized gauze.

The surgeon prepares himself as he would for any major operation, and sits on a stool facing the perineum and with his back to the light.

EXTERNAL URETHROTOMY FOR BLADDER DRAINAGE.

This operation is performed for draining the bladder in cases of chronic cystitis and urethritis that have resisted all forms of local treatment and that are not complicated by stricture.

A full-sized Gouley's tunnelled sound (See Fig. 32, Page 125) is passed to the bladder as a guide to cut upon, and held exactly in the median line by an assistant, who also retracts the scrotum and bulges out the

perineum by pressing the convexity of the instrument downward and forward. An incision about two inches in length is then made in the median line down to the groove on the convex side of the guide, and the urethra opened by a single cut, through which the index finger may be passed to explore the bladder, and if so desired, to dilate the prostatic urethra. An Otis perineal tube of about No. 30 to 35 French (See Fig. 36) is passed into the bladder and held there by means of a silk suture, which, being passed through both edges of the wound and the tube, is securely tied. The bladder is irrigated with warm boric-acid solution, which is thrown in by means of an Ultzman hard-rubber hand-syringe

FIG. 36.

Otis perineal tube.

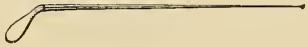
or irrigator through the perineal drain, which, when the bladder is partially filled with warm solution, should be clamped, to retain a few ounces of fluid in the bladder until drainage is established. Bleeding points are caught and ligated, the wound packed with iodoform gauze, an opium suppository administered, and the dressing held in place by a firm T bandage. When the patient is put to bed the clamp is taken off and the perineal tube is attached to a piece of rubber tubing by means of a glass coupler through which we can see whether the bladder is draining properly or not. The tubing terminates in a bottle under the bed, which is one-quarter filled with 1–1000 bichloride solution;

this keeps the urine sweet which runs into it and prevents the entrance of air into the bladder. The perineal tube is left in place for from one to two weeks, according to the results obtained, but must be taken out every few days and cleansed to prevent the deposit and accumulation of urinary salts upon and within its interior. During this time the urethro-cystitis is being treated by irrigations and internal medication. When the tube is removed permanently the perineal wound should receive special attention to promote its rapid healing.

EXTERNAL URETHROTOMY. GOULEY'S OPERATION.

The patient being prepared for operation as already described, a whalebone filiform bougie is passed through the stricture into the bladder. A good-sized Gouley tunnelled sound is then passed over the filiform to the anterior face of the stricture and held there exactly in the median line by an assistant, who pressing the instrument downward, renders the perineum tense. The operator then cuts down on the groove on the convex surface of the sound, being careful not to cut the filiform guide. The urethra is opened by a single clean incision, which thus exposes the sound and the filiform bougie lying in its groove. The sound is now with

FIG. 37.



Arnott's grooved probe.

drawn and Arnott's grooved probe (See Fig. 37) passed into the bladder by the side of the filiform which

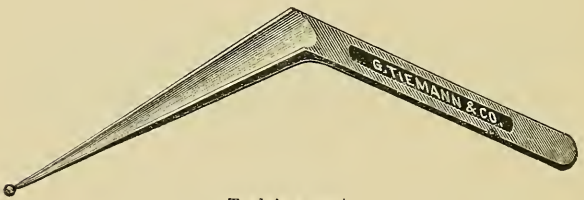
is then removed. The probe being firmly held in the median line, Gouley's beaked bistoury (See Fig. 38) is

FIG. 38.

Gouley's beaked bistoury.

passed in its groove, and the stricture cut on the roof of the urethra; the bistoury is then withdrawn, the probe inverted so that its groove looks downward, and the stricture incised on the floor of the urethra in the the same manner as on the roof. Teale's gorget (See Fig. 39) is now passed through the thoroughly divided

FIG. 39.



Teale's gorget.

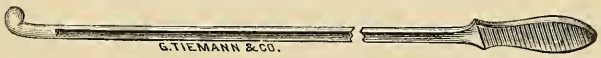
stricture into the bladder, from which the urine flows. A full-sized sound is then passed through the meatus into the bladder to see that all is clear, and the perineal tube is introduced over the gorget, which is then taken out; the subsequent steps in regard to drainage, dressing, irrigation, etc., being precisely the same as those already described on page 134, except that the tube is removed permanently on the fifth to the seventh day, and full-sized sounds passed into the bladder every other day until the perineal wound is cicatrized, when the intervals are made much longer. The bladder

should, as a rule, be explored by the index finger, as in these cases small calculi are sometimes found in the prostatic urethra or bladder, beside which the finger passed into the bladder, dilates the prostatic urethra, which is usually contracted in these cases, thus preventing post-operative tenesmus, and detects any stricture tissue that has not so properly divided on the roof of the canal.

EXTERNAL URETHROTOMY. WHEELHOUSE'S OPERATION.

This operation is employed in cases that will not admit of the passage of any instrument through the stricture. The patient is prepared and placed on the operating table as above described, and a last attempt made to enter the bladder under general anæsthesia; this failing, a Wheelhouse staff (See Fig. 40) is passed down to the

FIG. 40.



Wheelhouse staff.

anterior face of the stricture, with its groove toward the perineum, and held there by an assistant, who at the same time retracts the scrotum. The operator cuts down on the staff through the perineum, opening the urethra on the groove of the instrument just in front of the stricture; the cut edges of the urethral wound are retracted by long silk ligatures passed through them. The staff is now withdrawn until its extremity appears in the wound; when it is turned around so that its groove looks toward the pubes, and the bulbous point

hooked under the upper angle of the urethral wound, which it retracts upward. The operator now has a clear view of the anterior face of the stricture; this is carefully examined for its opening by means of Arnott's grooved director, which is passed through it into the bladder. The stricture is divided with Gouley's beaked bistoury on the director, and a sound passed from the meatus to the bladder to see that no contraction has been left.

The drainage, dressing, irrigation and post-operative dilatation is the same as in the perineal operations above detailed.

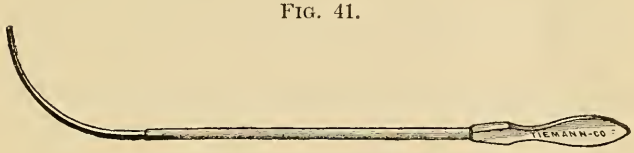
If the opening in the stricture cannot be found the surgeon will then have to complete the operation without a guide, cutting through the stricture slowly and carefully in the median line with perhaps the index finger of the left hand in the rectum, which, pressing up against the membranous urethra, keeps the operator informed as to the proximity of the rectum and the position of the apex of the prostate gland, both of which are valuable landmarks. This part of the operation will be much simplified by keeping the operative field thoroughly sponged, and the urethral wound well retracted, so that the surgeon can see the progress he makes. The mucous membrane of the roof of the urethra is also a serviceable guide, as it can be plainly seen and felt.

EXTERNAL URETHROTOMY. SYME'S OPERATION.

This operation is practically the same as Gouley's, except that the cutting is done on a Syme's staff (See Fig. 41), which is grooved on its convex surface, as the

figure shows. The tip of the staff is so sharp and pointed that even in the most skillful hands it is at best a dan-

FIG. 41.



Syme's staff.

gerous instrument, and should, therefore, not be used when we have whalebone filiform guides and tunnelled sounds at our command.

PERINEAL SECTION. COCK'S OPERATION.

This operation, also known as external urethrotomy without a guide, is performed in those cases which will not admit of the passage of any instrument through the anterior urethra. It is, therefore, done without a guide, and should not be undertaken unless the surgeon is thoroughly familiar with this class of perineal operations and the clinical anatomy of these parts.

The usual preparations for perineal operations having been made, the surgeon makes a last attempt to pass a filiform guide under ether, which, if accomplished, converts the perineal section into an external urethrotomy with a guide; this attempt having failed, the steps in the operation are as follows: the index finger of the left hand is introduced into the rectum, and its tip kept in contact with the apex of the prostate gland. The knife is then thrust into the median line of the perineum, about an inch above the anus, and carried toward the finger in the rectum, opening the urethra just at the

apex of the prostate; or the operator can cut down to the urethra by a long incision, as in an ordinary external urethrotomy. A probe-pointed director or gorget is now passed through the perineal wound into the bladder, which should be explored by the right index finger, and all of the stricture tissue thoroughly divided, not only on the floor, but also on the roof of the canal. The drainage and the subsequent treatment are precisely the same as described in the other perineal operations. The anterior stricture or strictures may be removed by immediate internal urethrotomy, or post-operative dilatation as indicated.

RETROGRADE CATHETERIZATION.

If it is impossible, as it very rarely should be, to find the urethra and to enter the bladder by the perineal route, then, the case urgently demanding it, the surgeon may perform suprapubic cystotomy, and, guided by the index finger in the bladder, pass a woven catheter or bougie through the small suprapubic incision into the vesical orifice of the urethra, down through its prostatic portion, and out into the perineal wound, thus locating the canal. This method, however, should only be employed in cases of extensive laceration or rupture of the urethra, caused by severe blows or falls on the perineum, either with or without fracture of the pelvis; in these cases the tissues are sometimes so lacerated and filled with blood clots that it may be impossible to find the proximal end of the urethra. This must always be done, in order to drain the bladder, and if so desired to approximate with gut sutures the ends of the injured canal, through which a soft-rubber catheter is passed to

the bladder and retained there until the urethral wounds have cicatrized, which will in a great measure prevent the formation of traumatic stricture. The urethra may, however, be left to granulate, and the bladder drained, and the case treated as above described under external urethrotomy for stricture ; the choice of procedure resting entirely with the operator.

RETENTION OF URINE.

Retention of urine may occur during the course of acute gonorrhœa from inflammatory swelling of the urethral mucous membrane, with spasm of the compressor urethræ muscle ; it is also a frequent complication of stricture of the urethra, the mucous membrane covering which becomes suddenly swollen and congested from alcoholic and sexual excesses, unskilful and over-zealous instrumentation, catching cold, bodily fatigue, irritating urine, etc. Retention of urine is of frequent occurrence after surgical operations on the perineum, genitals, rectum or anus, being due to spasm of the compressor urethræ muscle. In old men, with hypertrophied prostates, retention frequently follows mild excesses in eating and drinking, exposure to cold, or over-exertion, or, in fact, anything that tends to congest the mucous membrane of the prostatic urethra and the prostate itself. These cases may be associated with compressor spasm caused by the prostatic irritation.

Treatment. If retention occurs during the course of an acute gonorrhœa the patient should be put in a hot sitz bath for at least fifteen minutes, and given opium internally, or a hypodermic of morphine, provided the bladder is not too much distended. Hot

water may also be injected into the rectum while the patient is in the bath. If these means fail to relieve the spasm and congestion in the urethra, the patient must be catheterized with a medium-sized, soft-rubber, velvet-eyed catheter. Should a more rigid instrument be required we may then use either a straight blunt or olivary pointed silk catheter (See Figs. 42 and 43),

FIG. 42.

Straight blunt woven-silk catheter.

FIG. 43.

Straight olivary pointed woven-silk catheter.

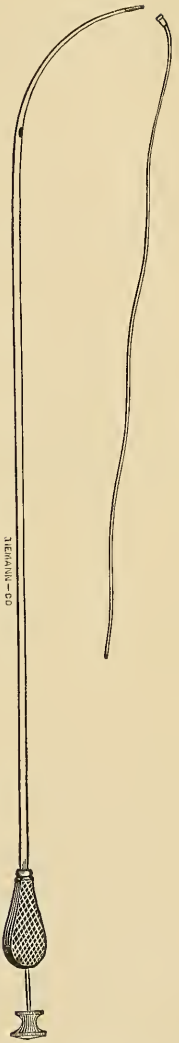
which, although firm, are very flexible and readily adapt themselves to the urethral curves. The glans and meatus are washed with 1–1000 bichloride solution, and a clean catheter, properly lubricated, is passed slowly and gently down to and, if possible, beyond the obstruction, the urethra being gently irrigated, if so desired, with warm boric-acid solution as the catheter glides down the canal. When the bladder has been emptied a few ounces of the solution should be left in.

When retention is caused by stricture of the urethra we may first try the hot bath, hot rectal injections and opium (unless the bladder is very greatly distended), which in some cases are successful; if they fail, however, we then resort to catheterization, using any of the instruments above described for this purpose, or a small English gum catheter with stylet, about No. 6 of the

Fig. 44.

English gum catheter with stylet.

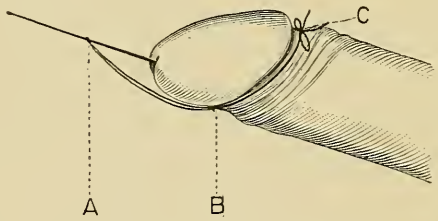
Fig. 45.



Bumstead's retention catheter.

French scale (See Fig. 44), which can be bent in any fashion. Bumstead's retention catheter (See Fig. 45) is sometimes very serviceable, provided the filiform guide to which it is screwed can be passed through the stricture. If we are still unsuccessful in reaching the bladder the urethra is then injected full of warm olive oil, which is retained by compressing the meatus, and several filiform bougies are passed successively down to the face of the stricture, the penis being held on the stretch and at right angles to the body. Each filiform is tried in turn, until one finally passes the stricture and enters the bladder; this one is always left in and the others removed. The filiform that has entered the bladder can be retained by tying it in with a piece of strong waxed thread or silk (See Fig. 46), which is

FIG. 46.



Filiform bougie tied in the urethra.

first tied securely about the filiform as it emerges from the meatus (*A*), then knotted about an inch from this point (*B*), and the two long ends brought around in the sulcus behind the corona, and tied in a bow knot on the dorsum (*C*); if the penis becomes erect the knot can be loosened. In a short time the urine may begin to dribble out along the side of the retained filiform,

but this is not always the case. Using this filiform as a guide, we may either pass a Gouley's tunnelled catheter (See Fig. 47) over it and draw the urine, or

FIG. 47.

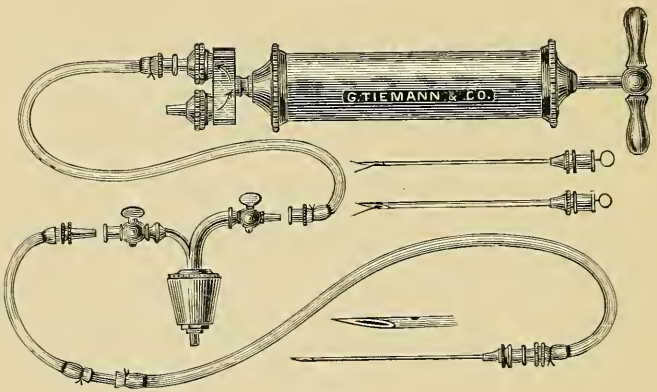
Gouley's tunnelled catheter and guide.

several sizes of Gouley's tunnelled sounds, and in this manner dilate the stricture rapidly. If deemed advisable at this time, the surgeon should perform external urethrotomy, using the filiform as a guide, and in this manner relieving the retention and cutting the stricture at one sitting.

If it is impossible to pass any instrument through the stricture we then resort to suprapubic aspiration of the bladder, passing the needle through the space of Retzius and anterior bladder wall, which fortunately, is not covered by peritoneum when that viscus is distended with urine. Aspiration is performed as follows; the operative field is shaved and rendered surgically clean, and a few drops of a four per cent. solution of cocaine are injected beneath the skin, directly in the median line and just above the symphysis; the integument over this spot is incised for about a quarter of an inch, and a sterilized aspirating-needle thrust downward through the incision into the bladder and the urine drawn, after which a little warm boric acid solution may be thrown into the bladder through the needle if

so desired. The needle is then removed, and the little puncture dusted with iodoform and covered with collodion or rubber plaster. Fig. 48 shows a very good and

FIG. 48.



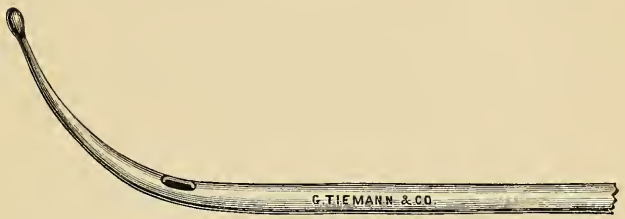
Aspirator.

compact form of aspirator, which can be attached to any ordinary glass bottle.

If the retention is due to prostatic hypertrophy we should first try heat and opium, as already described, especially if it is the first attack the patient has ever had, as in such cases the urine is unusually clear, instruments never having been passed and infection is therefore, very liable to occur from traumatism of the congested prostatic urethra. These means failing we may then resort to catheterization in the following manner. The surgeon's hands, the meatus and the glans are rendered surgically clean, and clean catheters, covered with sterile lubricants, are passed slowly, gently and skillfully, so as not to cause the slightest contusion or abrasion of the urethral mucous membrane, especially

its congested prostatic portion; we may use either curved, olivary-pointed, woven-silk catheters (See Fig. 49), or the Mercier coudé or bicoudé catheter made of

FIG. 49.



Curved olivary-pointed woven-silk catheter.

soft rubber or woven-silk. (See Fig. 50.) The angle in these instruments enables them to ride over the bar or posterior median enlargement of the prostate, which is situated at the vesical orifice of the urethra. The

FIG. 50.

Mercier coudé and bicoudé catheters.

English catheter with stylet is sometimes serviceable in these cases, as is also the Otis prostatic guide (See Fig. 51), over which is drawn a small soft-rubber catheter. It is always best in these cases to try the soft-rubber instruments first, as they are less liable to produce traumatism, which is the first step toward bladder in-

fection with its train of distressing and dangerous sequelæ. If the bladder cannot be entered with any of the above instruments, then the silver catheter with prostatic curve may be employed in selected cases, the

FIG. 51.

Otis prostatic guide.

surgeon always bearing in mind the traumatism that this rigid and unyielding instrument is liable to produce even in trained hands. If catheterization is impossible, the patient must be aspirated as above described.

In all cases of retention of urine, but especially in those due to stricture of the urethra and hypertrophy of the prostate gland, never draw all of the urine, as the sudden and complete evacuation of the bladder, especially in old prostatics, is very liable to be followed by severe shock and suppression, or by brisk hemorrhage in the kidneys, bladder or both. If by some mistake the bladder has been completely emptied, then several ounces of a warm sterile boric-acid solution should be thrown into the bladder through the catheter or aspirating-needle and left there.

In any case of retention, no matter what the cause may be, all instrumention of the urethra should cease as soon as there is much bleeding from the meatus, as this shows that the mucous membrane has been damaged and false passages probably produced; catherization at this time is futile, and should therefore be abandoned for the hot bath, aspiration and rest in the recumbent position.

URINARY FEVER.

Urinary fever, also known as catheter fever, urethral fever, urinary poisoning and urinary infection, may follow any of the various operations or instrumental procedures on the urethra and bladder, especially in those cases in which the mucous membrane is lacerated, the urine septic and the kidneys damaged.

Patients are occasionally met with in whom the easy and gentle passage of clean urethral instruments is followed by pallor, faintness and even complete loss of consciousness; this is merely a reflex nervous phenomenon which is in no way connected with true urethral infection.

Varieties. There are two main varieties of urethral fever, as follows:

In the first variety there is a slight rise in temperature, coming on after urethral operation or instrumentation, and preceded or accompanied by chilly sensations or a decided chill. These patients feel hot, uncomfortable and restless for a short time, after which they are perfectly well.

The second variety is more severe; the chill is sudden, well marked and prolonged, followed by a rise in temperature (sometimes as high as 105° F. or over), profuse sweating, and general depression of the vital forces. This severe form may recur with each attempt at urethral instrumentation, and is usually accompanied by partial or total suppression of urine. These patients are in a critical condition, as their kidneys are, as a rule, more or less diseased.

Etiology. In regard to the etiology of urinary fever positive statements cannot be made, except that it is

more apt to occur and to be more severe in patients with damaged kidneys, septic urine, and lesions of the bladder or urethral mucous membrane; in the severer cases we find the bacterium coli commune, which seems to be the principal factor in this peculiar form of urinary infection; its origin is as yet uncertain, the theory being that it comes either from the tissues, the urine or both.

In order to guard against urethral fever we must be absolutely aseptic in all of our operative procedures and instrumental examinations on the genito-urinary tract, and endeavor not to produce lacerations or abrasions of the bladder or urethral mucous membrane by over-zealous and rough instrumentation.

Treatment. The patient is kept in bed and made as comfortable as possible by means of quinine, morphine, alcohol baths and antipyretics; cardiac stimulants are administered if indicated, and should there be any sign of suppression of urine, we must immediately order cups over the kidneys and hot-air baths, with diuretin, digitalis, sweet spirits of nitre and copious and frequent draughts of water. Hot normal salt solution is of great service in some of these cases, and may be administered either by infusion into the median bacilic vein, subcutaneously with a small aspirating needle, or injected into the rectum. If there are any operative wounds of the urethra, they must be kept clean by irrigation with sterile boric acid or salt solution, and the urine drawn with sterilized catheters. Boric acid, benzoate of soda, etc., given internally do have some effect on the urine, and may therefore be employed.

CHAPTER XIX.

URETHRAL INSTRUMENTS.

THEIR CARE, LUBRICATION AND USE.

Many of the present methods advocated for sterilizing urethral instruments, by means of formal, or formalin, and trioxymethylene, or paraform, are so elaborate, lengthy and complicated as to be impracticable for the physician, and the patient as well, and for this reason their technique is omitted in the following pages, and a description of simpler and more practical methods given, which, if carefully carried out in all of their details, will not be found wanting in any way. It must be remembered that in the great majority of cases demanding urethral examination and treatment the mucous membrane is already secreting pus or muco-pus, and there is, therefore, no practical reason that our instruments should be absolutely sterile, but it is imperative that they be clean, their surfaces smooth, highly polished and non-irritating, and, also, that the surgeon be so careful, gentle and skillful in his instrumental manipulations that he does not cause contusions, abrasions or lacerations of the mucous membrane, over which purulent urine subsequently flows, the septic material from which being absorbed by the wounded mucous membrane is very apt to give rise to alarming and even fatal manifestations; this point is of paramount importance and is not always appreciated by the surgeon.

The examiner must always bear in mind the practical point, that extreme gentleness is of as much importance as the proper cleansing of his instruments, and that many of the present methods advocated for this latter purpose with formalin, formaldehyde, etc., render the surface of flexible instruments so rough and irritating to the urethral mucous membrane that they are really unfit for practical use, although from a laboratory standpoint they may be absolutely sterile and harmless.

SOUNDS.

Sounds should be kept separate from each other to prevent scratching or denting of their nickel-plated surfaces, which ought always to be intact, smooth and highly polished. When passed for the first time on a patient with clear urine they should be washed with soap and hot water, dried on sterilized or plain absorbent gauze, and dipped up to the handle in alcohol, which is then lighted and allowed to burn off; or after washing, the sound may be boiled in soda solution (to prevent rusting), or plain water, if this method be preferred to the flaming process. The sound can now be cooled, if so desired, by dipping it in cold sterile water. For ordinary cases, however, washing with soap and water and drying on clean absorbent gauze is all that is really necessary.

TUNNELLED SOUNDS.

Tunnelled sounds are prepared in the same manner as ordinary sounds, great care being taken to render the tunnelled portion clean, with a stiff nail brush, soap and hot water.

OLIVARY BOUGIES, AND BOUGIES À BOULE.

These instruments should be soft and flexible, with smooth and polished surfaces. Some of the makes can be boiled in plain water if so desired, but washing in soap and hot water, and drying with absorbent gauze, is all that is really essential, as the majority of cases for which these instruments are employed are none of them absolutely clean. When not in use they should be laid away straight, and separate from each other.

WHALEBONE FILIFORMS.

Filiforms must be kept straight, as coiling or bending roughens and splits their surface, thus rendering them unfit for use. It is well to oil them sparingly from time to time, and to keep them in tightly covered metal cases, as they are liable to be attacked by a parasite, which renders them brittle and useless. Washing in soap and water, and drying on plain or sterile gauze, is quite sufficient to render them clean and ready for use, at which time they must be quite rigid; consequently they must not be laid out in watery solutions, as they then become too soft and flimsy to pass through tight strictures.

URETHROTOMES.

These instruments are rather difficult to clean, and require a thorough and careful scrubbing with a stiff brush and plenty of soap and hot water; they are then dried with absorbent gauze, boiled for ten minutes in soda solution to prevent rusting, or flamed with alcohol. The blades should not be boiled or flamed,

even for a short time, as it destroys their keen edge; they are, therefore, first washed in soap and hot water and then laid in absolute alcohol, or 1–20 carbolic acid solution.

SILVER CATHETERS.

Silver catheters should never be used when soft-rubber or woven ones can be employed, on account of the traumatism they are liable to produce, even in skillful hands. These instruments, with their obturators, or stylets, are washed with soap and hot water and their interior injected with hot soapsuds and alcohol; they may then be boiled or flamed off with alcohol. The tip beyond the eye should be made solid, so as to prevent any form of dirt from collecting there.

TUNNELLED CATHETERS AND ENDOSCOPIC TUBES.

These instruments are cleaned in the same manner as the ordinary silver catheters, great care being taken to see that the tunnelled portion is thoroughly cleaned.

WOVEN CATHETERS.

These instruments are covered with gum, varnish or shellac, which gives them a smooth and highly polished but very delicate surface, which should always be intact when used. Some of these catheters are so constructed that they can be boiled for a few minutes in plain water, which of course, is a great advantage; others, however, cannot be, and must therefore be cleaned by washing in soap and hot water and injecting hot water through them, after which they may be dipped in cold sterile

water to restore their rigidity, if so desired. It is important to have the portion beyond the eye made solid. They should be laid away straight and not in contact with each other.

SOFT RUBBER CATHETERS.

These are the catheters of choice and should, if possible, be used in preference to either woven or silver instruments in all cases. The surgeon should always buy the highest grade of these instruments, as the inferior ones have a rough, irritating surface, poorly constructed eye and lose their elasticity in a short time. The eye should be placed as near the tip of the instrument as it possibly can, thus obviating a dangerous lurking place for dirt. Soft-rubber instruments should be washed in soap and hot water and have plenty of hot water injected through them, after which they are boiled in plain water, as this process does not injure them in any way for some time. The surgeon should examine these instruments from time to time, as the rubber, especially about the eye, is liable to become brittle, which condition, if not noticed, may result in the breaking off of the end of the catheter while in the bladder. Should such an accident occur the patient must be notified of it at once, and the piece removed with a lithotrite, or, this failing, through a small perineal cystotomy incision. They should be laid away straight and not in contact with each other. During the heat of summer soft-rubber and flexible instruments, unless in daily use, should be lightly dusted with French chalk to prevent them from sticking together, which destroys their delicate surfaces.

LUBRICANTS.

These substances must be clean and smooth, and absolutely non-irritating to the urethral mucous membrane. White vaseline, olive oil, glycerin, and a preparation of Irish moss, known as "Lubri-chondrin,"[1] are all that the surgeon requires; each of these substances being readily sterilized if so desired; practically, however, there is no need of using sterilized lubricants, except for aseptic cases, provided the lubricant be kept clean and fresh, in tightly stoppered glass jars.

White Vaseline. White vaseline, although a good lubricant, is so greasy, and difficult to wash off, that I have substituted for it "Lubri-chondrin," which is free from grease, soluble in water, readily washed from the exterior and interior of instruments, the meatus, glans, and the operator's fingers, and is put up sterilized in deep glass jars and collapsible tubes, which latter are convenient and reliable when one is summoned in haste to cases demanding aseptic catheterization or instrumentation.

Glycerin. Glycerin is a good lubricant, provided the instrument be warm, but on cold or even cool metal instruments it runs together and does not give a smooth, uniform coating; it is sticky, and to some mucous membranes irritating.

Olive Oil. Warm olive oil, either plain or sterilized, is very useful for lubricating and distending the urethra in cases of tight and filiform stricture; being injected with an ordinary hand-syringe.

[1] Manufactured by Van Horn & Co., New York.

INSTRUMENTATION.

The following points in technique will be found of practical advantage, and should be systematically carried out in all cases of urethral exploration, examination and treatment.

1. For aseptic cases the examiner's hands should be most carefully cleansed and prepared, sterile gloves being worn if so desired; personally, however, I consider the use of gloves an extreme and unnecessary fad. For ordinary cases washing the hands in soap and water is quite sufficient.

2. In aseptic cases the penis, preputial cavity and entire glans are washed off with 1–1000 bichloride of mercury solution; in ordinary cases, however, wiping the glans penis and meatus with warm water is all that is necessary.

3. Urethral irrigations before instrumentation, should only be employed when the urethra is filled with secretion, that cannot be flushed out by the urine, on account of the traumatism and irritation that even they are liable to occasion, and also the fact that fluid thrown into the anterior urethra by catheter escapes at the meatus and does not distend the canal sufficiently to efface all of its folds, especially in the bulbous portion, and therefore, cannot even cleanse it thoroughly. Warm sterile salt or boric-acid solution should be used for these irrigations in preference to solutions of bichloride of mercury, nitrate of silver or permanganate of potash, as any of the latter, if used in sufficient strength to be of real germicidal value set up more or less urethral congestion and irritation, which condition is just what we should avoid and guard against in

these cases, especially at the beginning of "catheter life."

4. Be sure that the patient lies squarely on his back, with muscles relaxed.

5. Surround the penis with sterilized or clean towels to prevent instruments from being contaminated by contact with the patient's body or clothing.

6. Solid or rigid instruments must never be used, when soft-rubber ones can be employed, on account of the traumatism that may be occasioned by the former.

7. Perfect instruments, cleaned and lubricated as above described, should be passed so gently and skillfully through the urethra that they do not cause the slightest contusion or abrasion of this delicate, highly vascular and sensitive mucous membrane, which, when the seat of traumatism, is so liable to give rise to alarming and even fatal conditions.

PART II.

THE CHANCROID.

CHAPTER XX.

INTRODUCTION.

The chancroid, also called the soft chancre, the simple and non-infecting chancre, or the local contagious ulcer of the genitals, is an acute inflammatory and destructive lesion, whose action is purely local in character and limited to the parts upon which it is situated, and to the lymphatic vessels and glands in anatomical relation with those parts.

INFECTION.

Chancroidal infection may be either direct or mediate.

Direct infection is caused by the transferrence of the secretion from the genitals of one person to those of another during coitus or unnatural practices.

Mediate infection is that mode in which the pus is transferred upon any article to a healthy individual, the agents of transfer being surgical instruments, dressings, towels or the fingers. Although this manner of chancroidal infection is quite rare, it does sometimes occur.

ETIOLOGY.

The chancroid is in reality an "infected or septic ulcer" of the genitals. It is frequently caused by the secretion of a chancroid, a chancroidal adenitis, or lymphangitis. It also originates from pus derived from the irritated lesions of syphilitics, and from irritated simple lesions in syphilitic subjects; or, in fact, any form of pus containing pyogenic microbes, as is well illustrated in those cases where men derive chancroids from women, who on careful examination reveal nothing but a purulent discharge, which, entering a hair follicle, chafe or abrasion on the male genitals, produces a chancroid.

Chancroids also originate de novo in subjects who have not had sexual intercourse for many months previous to the appearance of the ulcer, and therefore in no way related to it; these cases are sometimes followed by suppurative adenitis in either one or both groins. The infecting agent or cause of these chancroids is some form of dirt, which gains access to the tissues through a ruptured herpetic vesicle, or, in fact, any lesion which leaves a raw and absorbing surface. Such instances are frequently met with in patients with long foreskins who suffer from balanitis and herpetic vesicles, which if kept clean promptly heal, but if neglected may become infected and thus converted into typical chancroids, which are sometimes complicated by suppurating buboes.

Ducrey describes a rod-shaped bacillus with rounded ends which he always finds in the chancroidal secretions, and claims, therefore, that it is the specific factor in all cases of chancroid. Up to the present time, however, he has not been able to make satisfactory culture

and inoculation experiments, and, therefore, no positive conclusions or assertions in regard to its specific nature can be made.

CHARACTERISTICS OF THE CHANCROID.

The chancroid has no fixed period of incubation and usually makes itself manifest in a day or so after infection, its rapidity of development depending on the resistance of the tissues upon which it is situated; thus chancroids develop much more rapidly on mucous membranes and raw surfaces than they do upon the integument, which offers more obstruction to the invasion of the pyogenic microbes.

The chancroid usually begins as a small pustule, the mucous membrane or integument surrounding which is bright red in color; the pustule soon ruptures, leaving a round or irregular ulcer, with sharply cut *edges*, undermined *walls*, worm-eaten, rough and yellow *floor*, which gives rise to a brownish, purulent and auto-inoculable *secretion*. The surrounding integument or mucous membrane is bright red in color, due to the acute inflammatory nature of the lesion. There is an inflammatory *œdema* or thickening of the tissues around and beneath the sore, which shades off gradually into the surrounding parts, thus differing from the *induration* of the chancre, which is hard, firm and sharply limited.

DURATION OF THE CHANCROID.

The duration of the chancroid varies, and depends greatly upon its extent, situation and the treatment employed. Chancroids of the meatus are usually fol-

lowed by more or less contraction of the canal at this point, while those situated on the free edge of the prepuce lead to phimosis from cicatricial contraction of the preputial orifice.

SEAT OF CHANCROID.

Chancroids are most commonly found upon the genital organs of either sex, but may occur on the head, face and finger, usually from auto-inoculation. They may be situated either on the free border or inner surface of the prepuce, upon the penis at or within the meatus, on the glans, corona glandis, or in the sulcus behind the glans. When occurring on the scrotum, pubes, thighs or anus they are ordinarily due to auto-inoculation. As the result of unnatural practices, we sometimes find chancroids situated at the anus, within the rectum and on the perineum.

VARIETIES OF CHANCROID.

Follicular or acneform chancroid. This form of chancroid begins in hair or sebaceous follicles, and is situated at the junction of integument and mucous membrane, as upon the mucous membrane of the labia majora and the integument of the genital organs. It originates as a small pustule, which is soon converted into a deep, ragged ulcer, whose secretion is very destructive in character.

Ecthymatous chancroid. The ecthymatous chancroid is usually found upon those parts of the integument of the genitals which are dry and are not in contact with opposing surfaces. It begins as a little red

spot, which is finally converted into a pustule with an area of redness around it; the pustule increases in size and dries up into a blackish-green crust, beneath which is a typical chancroid.

Ulcus elevatum. The ulcus elevatum is merely that form of chancroid in which the tissues around and beneath the sore are unusually œdematous, thus raising the lesion above the level of surrounding skin or mucous membrane.

Serpiginous chancroid. This term is applied to any chancroidal ulcer which shows a tendency to extend at its periphery, and to invade and destroy the surrounding tissues to a greater or less degree. The lesion generally begins as a chancroidal bubo, which, if unchecked, may extend over the groin, abdomen, thighs, genitals and perineum; it is, however, rarely seen in these days of antisepsis and cleanliness.

Phagedenic chancroid. Phagedena is fortunately a rare complication of chancroid, and occurs in persons who are insufficiently nourished, and in whom the original lesion was too vigorously cauterized, and not kept in a cleanly condition.

There are two forms of phagedenic chancroid: first, the sloughing or gangrenous; and, second, the serpiginous.

The sloughing, or gangrenous, form has a foul purulent secretion, with sloughing and gangrenous floor, and is surrounded by œdematous tissues, which are purplish in color. It destroys the soft parts by extending in depth and at its margins.

The serpiginous form is similar to the above, except that its extension is more superficial in character.

CHANCROIDAL LYMPHANGITIS.

In chancroid of the penis the lymphatic vessels may become enlarged, hot, red in color, and very painful from absorption of the chancroidal secretions. This inflammation may either subside or go on to suppuration, with the formation of abscesses and chancroidal ulcers along the course of the lymphatic vessels.

CHANCROIDAL ADENITIS.

Chancroidal adenitis, or "bubo," as it is commonly called, is caused by the passage of septic secretions from the sore to the glands in the groin, by means of the lymphatic vessels of the penis.

The glands in either one or both groins become enlarged, matted together and very painful, while at the same time the skin over them assumes a red and brawny appearance. Suppuration of the glandular mass soon begins and converts it into a large abscess-cavity, which, if not incised, ruptures spontaneously, leaving a deep, sloughing pocket, with undermined and broken-down edges, thus constituting a typical chancroidal bubo.

DIFFERENTIAL DIAGNOSIS.

The chancroid may be mistaken for many lesions occurring on the penis, the most prominent among them being the hard chancre, ruptured herpetic vesicles, abrasions, chafes, fissures and exulcerated balanitis.

The hard chancre has a definite period of incubation, usually from two to three weeks, and under proper treatment becomes typically indurated, as do the glands

in anatomical relation with it; its secretion is serous, and its floor smooth, red and shining in appearance.

Herpetic vesicles coalesce, and are not so deeply ulcerated as chancroids, unless they become infected with some form of dirt, when they are in this manner converted into typical chancroids. The previous history of the formation of the vesicles associated with local pain and itching is of great aid in making a diagnosis.

In exulcerated balanitis the lesion is large and superficial, with smooth floor, and no undermining of the edges, as occurs in chancroid.

Abrasions, chafes and fissures, unless ulcerated, are readily recognized, as under appropriate treatment they heal rapidly, and leave no thickening or induration of the tissues upon which they were situated.

In diagnosing any lesion of the penis the physician must always use the greatest care and precaution before giving a positive opinion, as in many cases it takes several days for the lesion to assume its typical appearance. In the meantime these patients are treated locally by bland applications and told to refrain from sexual relations.

PROGNOSIS.

The prognosis of chancroid is, as a rule, good, provided the sore can be kept scrupulously clean and the parts put at rest. Chancroids of the meatus or urethra, and those complicated by a long, tight prepuce, are more difficult to keep clean, and, therefore, the prognosis as to a speedy cure is not so favorable as when the sore is more readily accessible.

CHAPTER XXI.

TREATMENT OF THE CHANCROID AND ITS COMPLICATIONS.

THE CHANCROID.

PATIENTS suffering from chancroid must be kept as quiet as possible, put on a light, nutritious diet and told to abstain from alcohol and sexual relations. The treatment of the sore depends somewhat upon its situation, the important points being to keep it absolutely clean, free from all irritation, separated from healthy tissues, and not to cauterize it unless positively indicated.

The sore and surrounding parts should be thoroughly washed in hot bichloride of mercury solution 1–2000 morning and evening, or more frequently if possible, and dried, the lesion itself being lightly dusted with subnitrate of bismuth, boracic acid, starch, iodol, nosophin or aristol. If the surface of the lesion is sloughy and shows no tendency to granulate, then iodoform, or equal parts of iodoform and boracic acid carefully applied, will be of great service; the objection to this dressing being its odor, which practically precludes its use in private practice.

If wet dressings are desired we can employ Red Wash, or solutions of boric acid, or bichloride of mercury, applying them on absorbent gauze or cotton, which is changed every few hours.

All of the dressings used upon or about the sore must

be destroyed, preferably by fire, as soon as removed, and the patient told to wash his hands very carefully immediately after the dressing is completed.

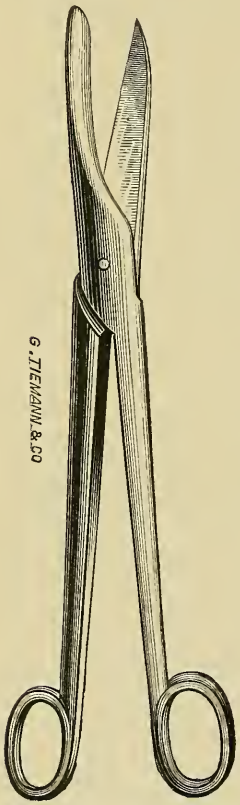
Cauterization. In the vast majority of cases cauterization is unnecessary and even harmful, provided the sore can be kept surgically clean in the manner above described.

If, however, in spite of cleanliness and proper local treatment, the lesion extends and threatens the destruction of the surrounding parts, then we must resort to cauterization in the following manner, using either liquid carbolic or strong nitric acid: the sore is carefully washed with 1–2000 hot bichloride of mercury solution, dried with absorbent gauze and lightly touched with liquid carbolic acid by means of absorbent cotton wrapped on a small wooden applicator, which is destroyed immediately after use. Care must be taken to apply the acid not only to the floor of the lesion, but also to its undermined walls and edges. A cold bichloride dressing is then applied for a few hours to allay the pain and inflammation following cauterization and the patient told to keep very quiet.

If carbolic acid is not strong enough we may then resort to nitric acid, cleaning and drying the sore as just described, and anæsthetizing it by means of an eight per cent. cocaine solution dropped on absorbent gauze, which is laid over the sore for a few minutes before the acid is applied; this should be done carefully and sparingly, the surrounding and healthy tissues being protected by a little vaseline. The subsequent treatment is the same as when carbolic acid is used, although the inflammatory reaction is much more marked.

Chancroids of the urethra require the following special treatment: the patient having urinated, the prepuce is retracted and the parts washed off with bichloride solution. A small, soft-rubber catheter lubricated with glycerin is then passed down the urethra beyond the lesions, and a pint or so of hot bichloride of mercury solution injected by means of an Ultzmann hard-rubber hand-syringe or irrigator. In this manner the canal is washed out from behind forward, the solution escaping at the meatus, where it is caught in a suitable vessel. Iodoform or equal parts of iodoform and boric acid are then blown into the urethra, which is lightly packed with sterilized or iodoform gauze.

FIG. 52.



Taylor's phimosis scissors.

Chancroids situated beneath a long, tight prepuce, which cannot be retracted, require very careful and active treatment. Frequent subpreputial injections of hot bichloride of mercury solution may be employed, but the better plan is to make two lateral incisions through the foreskin and expose the parts for inspection and local treatment, thus preventing sloughing, with more or less destruction of the glans and surrounding tissues.

Lateral Incisions (Taylor's operation). The patient having been etherized, the parts are shaved and rendered surgically clean in the usual manner, and with Taylor's phimosis scissors (See Fig. 52), a lateral cut is made through each side of the prepuce from its free edge, well down into the coronal sulcus, thus forming an upper and lower flap, which, when retracted, expose the entire glans penis and the inner surface of the foreskin, which is not the case when the dorsal incision is made. The parts are kept constantly irrigated during the operation with hot bichloride solution. The chancroids are then treated as already described, and the raw edges of the wounds protected from infection by frequent dressings and irrigations with very hot bichloride solution. The hemorrhage, which is quite free, is readily controlled by the pressure of the dressing. When the edges of the flaps are completely healed they may be removed by a simple plastic operation, which, if nicely done, gives the patient a very sightly organ.

If chancroids become serpiginous or phagedenic in character we must build up the patient's general condition by the administration of strychnine, iron or quinine, and plenty of good, nutritious food. The local treatment consists of frequent, copious and very hot irrigations of 1–2000 bichloride of mercury solution and soaking the entire organ in this solution every few hours. A dressing of powdered iodoform, frequently changed, is about the best, the parts being kept dry and clean. If cauterization is required, it must be performed in the manner already described; in severe cases, however, it is best to scrape off the sloughing floor and edges of the sore before applying the acid. In some

cases the local pain is so great that we are obliged to resort to the use of opium or morphine, either internally or by hypodermic injection.

CHANCROIDAL ADENITIS, OR BUBO.

If during the course of chancroids the inguinal glands become enlarged and painful the overlying integument may be painted with tincture of iodine or rubbed with compound iodine ointment, the latter being covered with absorbent gauze, which is held in place by a spica bandage. In spite of the counter irritant treatment above given the glands usually fuse together, break down and suppurate, thus forming an abscess, which must be treated either by evacuation of the pus and injection of iodoform ointment, or by free incision with removal of all of the infected glands.

First Method. This method, which was advocated by Helm in 1886, and which I have somewhat modified,[1] should be tried in all cases of suppurative adenitis, or bubo, as it leaves no scar, nor is it necessary for the patient to take an anæsthetic, remain in bed, or be subjected to a more or less painful and tedious convalescence. The steps in the procedure are as follows:

1. The operative field is shaved and rendered surgically clean in the usual manner.

2. A few drops of a four per cent. solution of cocaine are injected beneath the skin where the puncture is to be made.

3. A straight, sharp-pointed bistoury is then thrust

[1] "Iodoform-ointment Injections in the Treatment of Suppurative Adenitis of the Groin." Amer. Journ. of the Medical Sciences, Nov., 1895.

well into the most prominent part of the tumor until pus flows.

4. All of the pus is forced out through this opening by firm but gentle pressure, as this procedure is, as a rule, very painful.

5. The abscess-cavity is irrigated with pure peroxide of hydrogen until it returns practically clear.

6. It is then irrigated with 1–5000 bichloride of mercury solution, all of which is carefully squeezed out.

7. The now thoroughly cleansed abscess-cavity is completely filled, but not painfully distended, with ten per cent. iodoform ointment, by means of an ordinary conical glass syringe previously warmed in hot water.

8. A cold, wet bichloride dressing is applied with a fairly firm spica bandage, the cold congealing the ointment at the wound and thus preventing its escape into the dressing.

The patient should be kept very quiet for the first twenty-four to forty-eight hours, rest in bed being preferable, although not absolutely necessary.

The dressing is removed at the end of the third or fourth day and the parts examined. If pus has reaccumulated, or the ointment escaped into the dressing, a second injection may be made. If, on the other hand, all looks well, the first dressing is replaced by a gauze pad and spica bandage, and the patient told to report in two or three days for examination.

In order to secure the most favorable results from this method, it should only be employed when all of the glands are thoroughly broken down, so that the iodoform may come in direct contact with all of the infected tissue. If, after one, two or even three injections, this

method fails to produce the desired result an incision may then be made and the contents of the bubo removed, the previous treatment not having interfered in any way with this operation.

Second Method. The patient having been etherized, the operative field is shaved and rendered aseptic in the ordinary manner. A long, clean incision is then made over the most prominent part of the mass and parallel with the inguinal fold, thus exposing the broken-down, suppurating and infected glands, *every one of which must be removed*, great care being exercised not to wound the femoral vessels or their branches. Bleeding points are caught and ligated, and the abscess-cavity thoroughly irrigated with peroxide of hydrogen and hot bichloride of mercury solution 1–2000. The now clean and dry wound is lightly dusted with iodoform and packed with iodoform gauze, over which is placed the usual sterilized gauze and cotton dressing, which is held in position by a firm spica bandage. No attempt at suturing should be made in these cases on account of the inflamed and infiltrated condition of the tissues, which, if left free to drain, will, under the proper treatment, granulate quite rapidly from the bottom, and not be followed by sinuses, as is so frequently the case when the wound has been sutured, and primary union only obtained at a few points.

In severe cases, where the pus has burrowed down toward the thigh and up on the belly, it is well to combine a vertical with the transverse incision for purpose of better and freer drainage.

PART III.

SYPHILIS.

CHAPTER XXII.

INTRODUCTION.

Syphilis is a chronic, infectious and constitutional disease, always beginning in a local lesion called the chancre, which invariably marks the point of entry of the syphilitic virus or poison. Entering the system by means of the blood vessels and lymphatics, it attacks primarily the connective tissue, and may in its course affect every tissue and organ in the body.

The disease is characterized by an increase of the connective-tissue cells and by the development of a new tissue, called granulation or gummatous tissue, which is composed of small round cells resembling white corpuscles.

By some observers syphilis is thought to be caused by a micro-organism, but up to the present time no specific bacillus has been positively demonstrated in all syphilitic lesions, and, therefore, no uniform results or positive conclusions have been obtained.

Lustgarten discovered a bacillus in two cases of initial sclerosis and in a syphilitic gumma; he describes the bacilli as slightly curved rods, situated in the inte-

rior of nucleated cells. Other investigators have found different microbes in syphilitic lesions, which they claim to be the cause of the disease, but as none of these claims have been substantiated by culture and inoculation experiments they are, therefore, of little scientific value and cannot be accepted as at all conclusive.

FORMS OF SYPHILIS.

There are two forms of syphilis; the acquired form and the hereditary form; both are due to the same virus or poison, but differ in their course, lesions and symptoms.

Acquired syphilis is communicated by a syphilitic person to one free from the disease, the point of inoculation being always marked by the initial lesion.

Hereditary syphilis is transmitted in utero from either one or both parents, and in this form there is no initial lesion.

REINFECTION.

As a general rule, syphilis occurs but once in the same individual, although reinfection may take place both in the acquired and hereditary forms, as is shown by a few well-authenticated cases of second attacks.

STAGES.

The course of syphilis may, according to Ricord, be divided into three stages; the primary, the secondary and the tertiary; but it must not be forgotten that in a large number of cases tertiary lesions may occur in the secondary stage, or *vice versâ*, or that lesions of these different stages may be present at the same time, thus

showing that the disease does not invariably follow these sharply defined periods.

Primary stage. The primary stage consists of two periods of incubation. The first period of incubation exists from the time of infection to the appearance of the initial lesion, and, as a rule, lasts from fourteen to twenty-one days; but may be as short as ten or as long as seventy days. This is immediately followed by the second period of incubation, which dates from the formation of the initial lesion to the development of constitutional manifestations, and usually occupies forty to forty-five days, but may be prolonged to sixty, seventy or even ninety days.

These two periods of incubation make up the primary stage of syphilis, the duration of which is from fifty to eighty days.

The lesions of the primary stage are the initial lesion, or chancre, and the glandular and lymphatic indurations, in relation with the sore, these glands and vessels becoming indurated from about the tenth to the fourteenth day.

Secondary stage. The secondary stage of syphilis, or the stage of constitutional manifestations, now begins, and is characterized by superficial lesions of the skin and mucous membranes, as well as their dependencies, and by affections of the eyes and the lymphatic glands. The duration of this stage is variable, usually lasting from one to two years, and depending greatly upon the treatment, the habits and constitution of the patient.

Tertiary stage. The tertiary stage usually begins at about the end of the second year, but is not so fre-

quently observed now as formerly, owing to the improved methods of treatment during the first months of the disease. It manifests itself by gummous, tubercular, bullous and ulcerative lesions, also by affections of the nervous and vascular system, the viscera and bones.

CONTAGION.

The secretion of the initial lesion is highly contagious. The secretions of the secondary lesions (mucous patches, condylomata, etc.), the blood and the lymph, in the secondary stage, are also contagious. The physiological secretions, such as the tears, milk, saliva and sweat, are innocuous, unless mixed with the blood or secretions from primary and secondary lesions, which in turn render them contagious. The semen is innocuous upon a cutaneous or mucous surface, but may transmit syphilis to the ovum. The urine is in all probability also innocuous.

It is doubtful if the secretions of the tertiary lesions are contagious.

INFECTION.

Syphilitic infection may be either direct or mediate.

Direct infection takes place most frequently from the genitals of one person to those of another during coitus, also in unnatural practices between persons of the same or opposite sex.

Mouth-to-mouth infection, as in kissing, is not infrequent.

Surgeons, physicians, dentists and midwives are very liable to infection on the fingers and hands, and should, therefore, exercise great care in handling or operating upon syphilitic subjects.

Mediate infection is that form in which the syphilitic virus upon any article is transferred to a healthy person. The agents of transfer may be cigars, pipes, tooth-brushes, pencils, chewing-gum, handkerchiefs, whistles, drinking- and eating-utensils, razors, towels, toys, surgical operations—dressings, instruments, etc. Glassblowers are often infected, as a number of men use the same pipe. Vaccino-syphilis is rarely encountered at present, owing to the substitution of bovine for human virus.

When the disease is contracted in any of the above ways, that is, without sexual contact, it is called syphilis insontium, syphilis of the innocents, or unmerited syphilis. Syphilis is precisely the same disease and pursues essentially the same course whether derived from a primary or secondary lesion; in both cases the point of entry of the syphilitic virus being marked by the initial lesion or chancre.

CHAPTER XXIII.

THE INITIAL LESION.

THE initial lesion of syphilis is also called the chancre; the hard, indurated, infecting or Hunterian chancre: the initial sclerosis; the primitive or initial neoplasm and primary syphilitic ulcer.

It originates in the secretions of primary or secondary lesions, appears at the end of the first period of incubation (fourteen to twenty-one days), and is always situated at the point of entrance of the syphilitic virus. Usually there is but one initial lesion, although several may be present at the same time, infection having occurred simultaneously at several points.

SEAT OF CHANCRE.

Chancres found upon the genital organs are called *genital chancres;* those situated elsewhere upon the body are designated as *extra-genital chancres.*

Most frequently the initial lesion occurs upon the genitals, but may be situated anywhere upon the body—as the lips, the tongue, the tonsils, the eyelid or conjunctiva, the ear, the forehead, the neck, the fingers, the pubes, the belly, the breasts, the arms, the thighs, the hands or within the rectum.

In looking for the site of the initial lesion in obscure cases it is well to bear in mind the clinical fact that the lymphatic glands in relation with the sore are always the largest and most indurated.

VARIETIES OF CHANCRE.

There are six forms (Taylor) under which the initial lesion may appear in its beginning:

First. The chancrous erosion.

Second. The silvery spot.

Third. The dry papule, or patch.

Fourth. The umbilicated papule, or follicular chancre.

Fifth. The purple necrotic nodule.

Sixth. The ecthymatous chancre.

The chancrous erosion is the most common form. It begins as a small spot of excoriation, dark-red in color at first, but finally becoming coppery red. The surface is smooth and polished and destitute of granulations. The secretion is serous and profuse. Usually there is but a single erosion; exceptionally there may be several, in which case they are called multiple herpetiform chancres (Dubuc).

When, as the result of new cell-growth beneath it, the chancrous erosion becomes elevated above the level of the surrounding tissues it is called the ulcus elevatum.

The silvery spot is generally situated upon the glans and at the meatus; it is pin-head in size and silvery-white in color, as if the mucous membrane had been touched with pure carbolic acid or nitrate of silver. The lesion increases slowly, and is finally replaced by a smooth, shining surface typical of chancre.

The dry papule, or "papule sèche of Lancereaux," is always in a dry condition, as its name implies. It is generally single and begins as a dull-red spot. The surface is flat or convex, brownish-red in color, and destitute of secretion. In some cases the papule subsides, while in others it becomes exulcerous.

The umbilicated papule, or *follicular chancre*, is a rare form of the initial lesion; commencing as a small pinkish elevation with central depression, it increases in size and assumes a red color.

The purple necrotic nodule. This is a very rare form of the initial lesion, and usually occurs on the glans and in the sulcus behind the corona. Beginning as a small dark-red spot, it is finally converted into a purplish papule, which may either subside or go on to necrosis of the entire mass.

The ecthymatous chancre. By this form of initial lesion is simply meant a chancre that is covered with a brownish-black or greenish-brown crust, as the result of local irritation.

Beginning in any of the above forms, the chancre finally develops into a superficial erosion, with purplish zone, sloping sides, smooth red skin floor, profuse serous secretion, and situated upon and surrounded by a circumscribed mass of induration.

Infecting balano-posthitis. This is a form under which the initial lesion sometimes appears, and may be mistaken for simple balano-posthitis. The prepuce is infiltrated, its mucous membrane thickened, purplish-red in color, and slightly excoriated. The glans penis may or may not be eroded. In some cases the induration is evenly distributed, in others it is localized.

INDURATION.

The induration of the chancre is a cartilaginous hardness of the tissues around and beneath the sore, and is not really typical until about the tenth or fourteenth day after the appearance of the chancre. It is

due to a deposit of granulation tissue, which takes place without acute inflammation, and which is sharply defined at its circumference from the surrounding structures. The amount of induration varies greatly, and depends a good deal upon the site of the chancre; it is always well marked in the sulcus behind the corona glandis, at and within the meatus, or on the corona, but is absent or very slight on the glans itself. As a rule, the induration remains until the chancre has healed, although its duration is largely influenced by appropriate treatment.

Parchment induration is that variety of induration in which the deposit is superficial and confined to the tissues directly beneath the sore.

Relapsing induration. At any time during the course of syphilis indurated nodules may appear on the genitals; usually upon the site of the original lesion, they are either superficial or deep, and may be mistaken for primary lesions, especially when their surfaces become eroded and give rise to secretions. These nodules have been observed as early as the first and as late as the tenth year of the disease.

SECRETION.

The secretion of the chancre is profuse and serous in character unless the sore be irritated or infected, when it is rendered purulent.

DURATION.

The duration of the chancre varies in different cases and depends upon the treatment. It may remain until after the development of the secondary symptoms.

TERMINATION.

As a rule the site of the chancre is not marked by a cicatrix, but by a purplish-red spot, which in time fades to white.

SYPHILITIC ADENITIS.

The lymphatic glands in the immediate neighborhood of the chancre become indurated on about the tenth or fourteenth day of its existence; they are painless, freely movable upon and separate from each other, and do not suppurate unless the sore has been infected with pyogenic microbes. The overlying skin remains normal in all respects.

SYPHILITIC LYMPHANGITIS.

The lymphatic vessels become indurated about the same time as the chancre and run from it toward the nearest group of glands. They are hard and cord-like, and devoid of all acute inflammatory symptoms.

The following table shows the situation of the enlarged glands in relation to the chancre:

Chancres of the genital organs; of the integument in their immediate neighborhood, or of the anus.	Inguinal glands.
Chancres of the lips and chin.	Submaxillary glands.
Chancres of the tongue.	Subhyoid glands.
Chancres of the eyelids.	Pre-auricular glands.
Chancres of the fingers.	Epitrochlear and axillary glands.
Chancres of the arm and breast.	Axillary glands.

DIFFERENTIAL DIAGNOSIS OF THE CHANCRE AND CHANCROID.

Chancre.	*Chancroid.*
Has a period of incubation; generally two or three weeks.	Has no period of incubation.

Chancre.	*Chancroid.*
Looks like a superficial erosion.	Is "punched out" and excavated in appearance.
The edges are sloping.	The edges are undermined.
The floor is smooth, shining red or copper-colored.	The floor is uneven, "worm-eaten," and yellow in color.
The secretion is serous and profuse.	The secretion is purulent and auto-inoculable.
The induration is cartilaginous and sharply limited.	There is no induration, but the sore may be surrounded by a zone of œdematous infiltration, not sharply limited.
The neighboring lymphatic glands are indurated, painless, freely movable beneath the skin, not matted together, and do not suppurate unless infection has occurred.	If the neighboring lymphatic glands are involved, they form an inflamed, painful mass, which usually suppurates; the overlying skin becomes red, tender and hot.
The tissues around the sore are purplish in color from venous congestion.	The tissues around the sore are bright red in color from acute inflammation.

CHAPTER XXIV.

THE SECONDARY PERIOD.

In some subjects the commencement of this period, which begins at about the end of the forty-fifth to the ninetieth day, is marked only by cutaneous lesions (*syphilides*), while in others there are various constitutional disturbances, such as fever, headache, neuralgia, pains in the bones, muscles or joints, insomnia and anæmia.

Syphilitic fever varies considerably in different cases. It is most marked in women and nervous subjects, and may be either intermittent, remittent or continued in character; as a rule, it is higher at night and just prior to the appearance of an eruption, after the development of which it usually subsides spontaneously. The fever may be accompanied by chilly sensations, or even a well-marked chill, and followed by mild or profuse sweating; there is a corresponding acceleration of the pulse and respiration. Syphilitic fever is uninfluenced by quinine, but yields readily to mercurial treatment.

Neuralgic pains in different parts of the body, intense headache, and pains in the bones, joints, tendons and muscles, which become worse at night, are very common at this period of the disease.

Insomnia, accompanied by various delusions, is sometimes met with, especially in women and nervous subjects.

Anæmia during this stage is frequently encountered generally in run-down and debilitated subjects. There

is a marked increase in the number of white blood-corpuscles, with a corresponding decrease in the number of red corpuscles.

The skin and mucous membranes are very susceptible to irritation and inflammation, as may frequently be observed in the slow healing of wounds and scratches in syphilitic subjects.

Syphilitic analgesia consists in the loss of the sense of touch, of heat or cold, and of the perception of pain. It occurs in men and women, but most frequently in the latter sex. In some cases it extends over the entire body, while in others it is restricted to certain regions. Its favorite localities are the dorsal surfaces of the fore-arms, the hands, the ankles and the feet. Beginning during the early secondary period, it may last for several months.

Icterus is sometimes observed during the secondary stage, and is caused by a congestion of the mucous membrane of the ductus communis choledochus.

CHAPTER XXV.

THE SYPHILIDES.

The syphilides constitute the various lesions of the skin which may appear at any time during the course of syphilis; these syphilitic eruptions are caused by localized hyperæmia and cell-infiltration. The hyperæmic or erythematous syphilides are peculiar to the early stages, while those due to cell-infiltration appear later. The infiltrating cells are small, round, granular, nucleated bodies, resembling white blood-corpuscles, and very similar to the cells found in the initial lesion and the later gummatous tumors.

The course of the syphilides is chronic, and marked by the absence of acute inflammatory symptoms. As a rule, there is no pain or itching except when the lesions degenerate, or are situated on the scalp, when they may then cause more or less irritation.

Very commonly several varieties of lesions are present at the same time; this occurrence is due to the chronicity of the syphilides and their tendency to relapse. Their color, which is at first pinkish-red, finally fades to a brownish-red, copper, or "lean ham" color; these pigmentary changes are probably due to a deposit of the coloring matter of the blood in the affected spots.

Relapses, particularly of the erythematous and papular syphilides, are apt to assume a circular or ring-shaped form.

THE ERYTHEMATOUS SYPHILIDE.

Synonyms: Syphilitic erythema, syphilitic roseola, macular syphilide, syphilis cutanea maculosa, or syphiloderma erythematosum.

The erythematous syphilide is usually the first eruption to appear, and exists in all cases of syphilis, but may be so faint in some as to escape observation. The lesion consists of round, oval or irregular spots of hyperæmia with a diameter of from one line to half an inch. Their color varies from a delicate pink to a decided red or even purple hue. In some cases there is only a mottling of the skin, or the eruption is so faint as to be invisible except on careful examination. Exposure to cold brings the spots into view, and this can be accomplished by applying alcohol to the surface, or having the patient undress in a cool room.

As a rule, the eruption appears first near the umbilicus, then spreads over the trunk and extremities, especially on their flexor aspects; the dorsal surfaces of the hands and feet are rarely invaded, but the spots are very persistent on the palms and soles, where they may form scaling patches. On the back the eruption follows the obliquity of the ribs, from the median line outward. When it occurs on the scalp it is usually accompanied by alopecia. On the genitals of either sex the macules may hypertrophy, and thus form condylomata lata; the same is true if they are situated about the anus, the umbilicus, the nose, the mouth, or in the folds beneath and between the breasts, or where surfaces of skin are in contact. If the face be involved, the eruption is most marked about the nose, mouth, chin, and especially on the forehead at the border of the scalp, where the mac-

ules form the so-called "corona veneris." The eruption on the face is generally covered by fine scales of epidermis or yellowish-white crusts.

With this eruption we may have condylomata lata, alopecia, affections of the nails, slight periostitis, or even osseous lesions, and scaling of the palms or soles. Iritis is rare, but may occur at this period.

The course of the erythematous syphilide is slow, and its duration depends upon the degree of hyperæmia and the treatment. Relapses may occur during the first year, the eruption being localized, circular or ring-shaped.

THE PAPULAR SYPHILIDES.

The lesion of the papular syphilides consists of circumscribed cell-infiltration into the integument. It is sometimes the first eruption of the secondary stage, or may occur simultaneously with the erythematous syphilide, or even as late as the tertiary period.

There are two varieties of the papular syphilide: the conical or miliary papular syphilide, and the lenticular or flat papular syphilide.

THE CONICAL OR MILIARY PAPULAR SYPHILIDE.

This syphilide has two varieties: the large conical or miliary papular syphilide, composed of large papules, and the small conical or miliary syphilides, composed of small papules.

The large miliary papular syphilide is less common than the small variety, and is frequently associated with it. The papules are conical, red in color at first, but finally assume a coppery hue. They rarely appear

in large numbers, and are generally scattered over the body. The papules are most profuse on the back and buttocks, the front of the thighs, the face, and the back of the neck. They are very prone to postulate and degenerate into ulcers.

In the small miliary papular syphilide the papules are about the size of a pin's head, round or conical, sometimes umbilicated, and of a deep pinkish-red color. They are grouped either in the form of circles, segments of circles, or like the letter S or figure 8.

The eruption begins about the face, and thence invades the entire body. Frequently some of the papules are converted into vesicles or pustules, by the formation of serum or pus on their apices.

THE LENTICULAR OR FLAT PAPULAR SYPHILIDE.

There are two varieties of this syphilide: the small lenticular or flat papular syphilide, composed of small papules, and the large lenticular or flat papular syphilide, composed of large papules.

Small lenticular or flat papular syphilide. In this form the papules begin as little red spots, and rapidly increase in size to one-eighth or even one-quarter of an inch in diameter. They are round or oval, with flat surfaces and sharply limited margins. The papules first appear about the shoulders, the back of the neck or the sides of the thorax, and are rapidly followed by others on the face and the front of the neck; the trunk and body generally are then invaded, and on the back the eruption follows the course of the ribs. They are especially numerous on the flexor aspects of the extremities and near joints. The supra- and infra-clavicular

regions are not invaded. They are more numerous in the palmar than on the dorsal surfaces of the hands.

If the papules extend below the knees they are sparingly distributed on the inner surfaces of the legs, and sometimes on the soles. This syphilide frequently spares the face, although it may form the so-called "corona veneris."

The color, which is at first a pinkish-red, soon becomes coppery; on the legs it may be purple, owing to blood-stasis or effusion.

The amount of scaling varies greatly in different subjects and on the various parts of the body.

The scales on the papules are small, adherent and yellowish-white in color. Under mercurial treatment this eruption disappears rapidly, but leaves copper-colored spots of pigmentation.

A relapse of this syphilide may occur at any time within two years after infection, and the papules then tend to form circles, or segments of circles, on the elbows and knees, and may be accompanied by papules on the shoulders and trunk.

Large lenticular or flat papular syphilide. Commencing as small spots, the papules increase rapidly in size; they are elevated, sharply defined and covered with small scales; in diameter they vary from three-eighths of an inch to one inch. The color, which is at first red, soon becomes coppery. Their course is chronic. This syphilide really belongs to the middle and late periods of the secondary stage, is rarely seen as the first eruption, but frequently appears as late as the second and even the third year.

The eruption consists of a large number of papules

scattered irregularly over the body. Upon moist, warm and unclean surfaces papules, either large or small, become excoriated and transformed into condylomata with a foul secretion, as between the toes, around the umbilicus, at the margin of the nostril, on the perineum, about the genitals, and between the thighs and scrotum.

SCALING PAPULAR SYPHILIDE OF THE PALMS AND SOLES.

Scaling papular syphilides of the palms and soles may occur at any time during the secondary period or with tertiary lesions.

Their course is chronic, painless and unaccompanied by itching.

The well-marked scaling syphilides of the palms and soles may appear as early as the third month or much later. At first the papules are elevated, sharply defined and of a deep-red color; they increase in size, fuse together and form irregular spots and patches.

There is a general thickening of the epidermis, with scaling and redness of the surface; in severe cases the furrows of the hand may be converted into painful fissures, which are liable to last for months or for years. This affection may extend along the fingers to the nails, which become brittle and thickened. If the process continue, there may be a general cornification of the epidermis of the palm or sole, which becomes perforated with small holes, from which can be extracted chalk-like masses of epidermis; this condition is known by some as "syphilis cutanea cornea."

THE PUSTULAR SYPHILIDES.

These syphilides may appear at any time during the secondary stage, or even as late as the tertiary period. The pustules vary in size, from a pin's head to a ten-cent piece; are round or oval, and surrounded by a coppery zone. They may begin as papules or pustules. In some cases they cover the entire body, while in others they are limited to special regions. Relapses are very common. The crusts of the small pustules are greenish-brown in color; those of the larger and later ones being greenish-black, of firm consistence and somewhat adherent. Beneath the small crusts there is little if any suppuration, but under the larger ones there are well-marked ulcers, secreting thick, brownish-yellow pus.

THE SMALL PUSTULAR OR ACNEFORM SYPHILIDE.

This is a papulo-pustular syphilide and attacks the sebaceous and hair follicles. It consists of small, conical or slightly rounded pustules, which may form the entire eruption, or be accompanied by a papular or erythematous syphilide.

The appearance of this eruption is usually attended by fever, which may last days, or in some cases weeks, the temperature varying from 90° to 100° F., or over.

The color of the bases of the pustules is at first bright red, but rapidly becomes brownish-red. The apices of the pustules are first yellow, but the pus is soon changed into a greenish-brown, somewhat adherent crust.

In some cases the pustules are transformed into small ulcers; in others they run together, forming complete or partial rings.

The eruption usually begins about the face, the scalp, the back of the neck and the shoulders, and may then invade the entire body, but is most marked upon the scapular, sternal and gluteal regions, and on the outer aspects of the extremities.

This syphilide generally appears from the third to the sixth month of the secondary period, and may run a very chronic course; it relapses usually as a larger pustular or tubercular syphilide. The pustules leave small brown spots of pigmentation which disappear in a few months, or cicatrices which destroy the hair follicles, thus producing permanent alopecia.

THE LARGE PUSTULAR OR IMPETIGO-FORM SYPHILIDE.

This is a pustulo-crustaceous eruption, having a tendency to involve large areas of surface, and to become serpiginous in character.

It usually appears about the middle or latter part of the first year of the disease, but may occur earlier or later.

Most of the pustules are about the size of a pea or larger, and found upon the hairy parts, seldom on the hands and feet.

The eruption commences as red spots, which are soon transformed into pustules; these are covered by dark-brown adherent crusts, which may run together, thus forming patches that attain a diameter of several inches; this is well seen on the face, at the margin of the scalp, in the scalp itself, about the alæ nasi and commissures of the lips, upon the chin and in the beard.

In some cases the eruption becomes serpiginous, generally upon the upper extremities; it extends by a ring

of ulceration, covered with a crust, and enclosing a healed area of skin. This serpiginous process may be either superficial or deep, according to the amount and depth of tissue it destroys. In neglected and untreated cases the ulceration may cause great destruction of tissue, especially upon the face and head; this is rarely seen, however, if the patient receives early and proper treatment. Healing occurs under the crusts, which fall off, leaving smooth, red surfaces that remain pigmented for several months.

This eruption is rarely present with the erythematous syphilide, but is not uncommon with the papular variety; it generally occurs in debilitated and alcoholic subjects, or in those who have neglected early treatment.

THE VARIOLA-FORM SYPHILIDE.

This is a much less common eruption than the acne-form variety, and resembles variola and varicella.

It is composed of round, superficial pustules, beginning as red spots, which in a day or so are converted into pustules. The pustules are surrounded by a deep-red areola; when fully developed they become umbilicated. In about a week greenish-brown, slightly adherent crusts are formed, beneath which is an ulcerated base.

They run a chronic course, do not increase in size, but in severe cases may merge together.

They occur where the skin is soft and delicate, as upon the forehead, and at muco-cutaneous junctions, and are rarely found in the palms or on the soles.

The eruption begins about the face and spreads over the rest of the body.

When the crusts fall off their former sites are indicated by spots of pigmentation.

THE ECTHYMA-FORM SYPHILIDE.

There are two forms of this syphilide—the superficial and the deep.

The superficial form may appear at any time during the first year of syphilis, and consists of pustules; these begin as red elevations of the skin, which are soon transformed into pustules; these increase in size and are covered by round or conical crusts of a yellowish-brown color. Beneath the crust is an ulcerated surface, which secretes a thick pus.

The pustules generally appear first about the scalp, particularly at its junction with the face and neck, and in a short time invade the various parts of the body, as the anterior surfaces of the legs and forearms, the trunk and the inguinal and gluteal regions. The pustules may be disseminated, grouped in patches, or arranged in the form of circles or segments of circles. In some cases they leave cicatrices, while in others they do not.

The deep form of this syphilide is, as a rule, a late manifestation, but may be precocious, and is then very malignant.

The eruption begins as round or oval elevations, upon which pus forms; this dries into a blackish-brown crust, having beneath it a deep, sharply defined ulcer, which, when healed, leaves a white cicatrix.

When the eruption is matured, it consists of an incrusted papulo-tubercle, from one-quarter to one-half an inch in diameter, and surrounded by a coppery-colored zone.

It is most marked upon the anterior surfaces of the legs, the arms, about the face and on the lower portions of the trunk.

The eruption is developed very slowly and in successive crops.

RUPIA.

The eruption consists of ulcers covered by laminated crusts. It may appear during the first year of syphilis, but is usually a late manifestation of the disease.

There are two varieties of rupia: one in which the crusts are small, numerous and scattered; another, in which they are larger, less numerous and grouped together.

The lesion begins as a red spot which is transformed into a flat pustule; this soon dries into a small greenish-brown crust, having beneath it an ulcerated surface, the secretion from which forms another and larger crust under the initial one; this process continues, each crust being larger than the preceding one, until finally we have a conical, laminated, brownish-black, hard, adherent crust, beneath which is an undermined ulcer, with a foul purulent secretion and surrounded by an area of redness.

The small variety begins about the face or the forearms, and may then invade the trunk and the lower extremities.

The large variety is most common on the face and trunk, but may also appear on the extremities.

The lesion is generally single, although several may be formed at the same time.

The resulting cicatrices are shining white, depressed

and surrounded by a brownish line of pigment which remains for several months.

THE BULLOUS SYPHILIDE.

This syphilide begins as an effusion of serum beneath the epidermis, and, becoming turbid, is finally converted into pus. The pus gradually dries into an adherent greenish-black crust, beneath which is an ulcer.

The bullæ vary greatly in size and are surrounded by a red areola. They generally occur on the forearms and legs, but may also invade the trunk, and are then most marked upon the chest.

This is usually a late manifestation and runs a chronic course.

THE TUBERCULAR SYPHILIDE.

The tubercular syphilide consists of circumscribed or diffuse infiltrations involving the entire thickness of the skin.

It really belongs to the tertiary period, but may be developed early in the secondary stage.

The non-ulcerative or resolutive tubercular syphilide occurs in two forms: first, as sharply defined, conical, or rounded tubercles, and second, as more or less elevated, flat, sharply circumscribed, and often scaly patches. As a rule, these lesions do not ulcerate.

First form. The conical or rounded tubercles vary in size from one-third of an inch to an inch or more in diameter, and are deeply seated in the derma. They begin as pinkish or dark-red spots, and eventually become deep, circumscribed tubercles of a pinkish-red, coppery, or brownish-red color. On the face they have

a smooth, shining surface, with little or no scaling, but upon other regions they are frequently covered with large adherent scales.

If this syphilide appears in the secondary period it usually invades the entire body; but if it occurs later it shows a tendency to attack the face, the forehead, the scalp, the back of the neck, the shoulders, and scapular regions, the thorax, and especially the back, the gluteal regions, the outer aspects of the extremities near the joints and the backs of the hands, very rarely the palms and soles. When developed upon certain regions this eruption occurs in groups which may be either circular or irregular in outline. On the forehead it may form the so-called "corona veneris."

Sometimes upon the face one or more tubercles coalesce, forming a patch, which rapidly increases in size along its circumference, while atrophy and absorption take place at the center; in this way producing an elevated circle enclosing a central depressed patch of atrophied tissue.

On the body the course of this syphilide is practically the same as upon the face.

Second form. This consists of flat, sharply circumscribed, deeply seated patches, and is less frequent than the first form. It commences as small red spots which increase in size from one to two inches in area. The tubercles are slightly elevated, and look like patches of thickened and reddened skin covered with scales, and surrounded by a narrow areola of redness. They have a marked tendency to relapse.

Their course is chronic, lasting weeks, months and even years.

Exceptionally they form circles, or, if irritated, patches, which may increase at the periphery and atrophy at the center.

On parts subject to friction or pressure the tubercles sometimes ulcerate.

THE GUMMATOUS SYPHILIDES.

There are two varieties of these syphilides : the early secondary or precocious gummata, and those occurring late in the disease and called tertiary.

Of the early secondary or precocious gummata there are three varieties : the generalized, the localized and the neurotic.

The generalized variety may appear as early as the eighth week or as late as the middle of the second year of the disease.

It begins as small circumscribed swellings beneath the skin, which soon adhere to it and form bright red spots about the size of a bean. As they increase their color becomes coppery. When fully developed they are firm in consistence, and are then said to be in the stage of condensation ; as they mature they become softer and pass into the stage of softening.

If the disease progresses favorably these lesions do not ulcerate, but resolve, leaving spots of pigmentation.

This eruption may be general and involve the entire body. Its favorite sites are the arms, the forearms, the back, the chest, the gluteal regions, the thighs and the legs.

If ulceration takes place the tumors become dark red in color and fluctuating, the integument is destroyed,

and thus is revealed an unhealthy, undermined ulcer, secreting sanious pus.

The localized variety usually appears about the fifth month or within the first year, and in some instances even later. The tumors are the same as in the first variety, except that they are larger and more indolent.

The eruption is generally found on the head, the face, the pharyngeal walls, the mouth, the forearms and the legs, but may also be met with upon the trunk, the arms and the thighs.

These tumors, likewise, have the stages of condensation and softening; they may either be absorbed or ulcerate.

The generalized and localized varieties of gummata occur in elderly, debilitated and alcoholic subjects.

In the neurotic variety the syphilide appears during the very early months of the disease, is preceded or accompanied by severe neuralgic or rheumatic pains in the joints or muscles, and by general malaise and debility. There are flashing, burning pains, either intermittent or continuous, at the sites of the lesions. There are also some rise of temperature, loss of appetite and emaciation. The tumors generally occur on the forearms and legs, but may be found upon the shoulders, the arms, the thighs, the chest and the trunk.

This eruption consists of two lesions: first, of oval or round tumors or irregular plaques, and, second, of tumors situated in the subcutaneous tissue and freely movable beneath the skin and upon the fascia.

The tumors begin by infiltration into the skin and connective tissue; at first they are bright-red, round or

oval, circumscribed swellings, which soon become raised above the level of the surrounding integument.

In some cases the bright-red color becomes darkened into a blackish-red, in others into a deep bright-red, and again in others the center becomes white and is surrounded by a deep-red border.

Some cases resolve, others ulcerate, and if the latter be the case the resulting cicatrices are usually superficial.

LATE OR TERTIARY GUMMATA.

These lesions belong to the late stages of the disease, and consist of circumscribed tumors.

The eruption is composed of a small number of lesions whose course is slow and painless. It generally occurs on parts where the connective tissue is loose and abundant.

When the lesions are subcutaneous they are gummous or gummatous tumors; but if they ulcerate and involve the skin they are called gummatous ulcers.

This syphilide has three stages: the stage of tumefaction, the stage of ulceration and the stage of repair.

It commences as small, painless, movable nodules, about the size of a pea, and situated beneath the integument. As they increase in size they form adhesions with the skin, periosteum and fascia.

The integument over the nodules is at first red, but finally becomes coppery-red and much thickened.

The lesions are true gummy tumors, varying in size from that of a pea to several inches in diameter, more or less convex and surrounded by an area of inflammation. They are prone to develop in groups, and may

either fuse together or remain isolated. The tumors may remain solid for weeks or months, and with proper treatment undergo resolution; but, as a rule, they degenerate in either of the following ways: by ulceration, which may occur on the skin and involve the entire lesion, or the new growth may soften and cause ulceration in the skin. The resulting ulcer is similar in shape to the tumor; the floor is uneven, reddish-green or yellowish-green in color, and secretes sanious, fetid pus. The edges are sharply cut, perpendicular, and surrounded by an inflammatory areola.

The cicatrices, which are thin in some cases, but thick and rough in others, soon lose their coppery color, and become white.

The course of the gummata is very chronic. This syphilide may occur on the scalp, the face or the neck: its favorite sites are on the extremities, near the joints, the back more frequently than the chest, very often upon the gluteal regions, rarely upon the lower part of the abdomen, never on the palms or soles.

The ulcers may become serpiginous, phagedenic or gangrenous.

THE SERPIGINOUS SYPHILIDE.

There are two varieties of this syphilide: the superficial and the deep.

The superficial serpiginous syphilide belongs to the early period of syphilis, and begins as a pustule; a crust forms upon it, beneath which is a superficial ulceration: the crusts fall off except at the periphery, where they form a ring, the enclosed area being oval or round in shape and hyperæmic. Beneath the ring of

crusts is a corresponding ulcer, surrounded by an inflammatory areola. The ulcerative process extends, being covered by the crusts, while the central portion cicatrizes. When ulceration ceases, it leaves slight atrophy of the skin and copper-colored pigmentation.

The deep serpiginous syphilide originates in one of the late or tertiary lesions, such as a tubercle, an ecthyma-form pustule or an ulcerating gumma.

Changes similar to those in the superficial variety take place until there is developed a red cicatrix surrounded by a wide ring of greenish-black crusts, beneath which is an ulcerating, ring-shaped surface.

This syphilide is rather rare and chronic in its course, sometimes occupying years.

It causes little pain and usually occurs on the inner surfaces of the arms and forearms, upon the breast and the legs.

The resulting cicatrices may be thick or thin, and if situated near joints they are liable to cause permanent deformity from their contraction. The pigmentation finally fades, leaving white scars.

THE PIGMENTARY SYPHILIDE.

This syphilide occurs in the early months of the disease and consists of brown or yellowish-brown spots or patches.

There are three forms of the pigmentary syphilide:

The first form consists of sharply defined or irregular spots or patches, of a yellowish-brown or brown color, which is unaffected by pressure. They vary in size from that of a pea to an inch or even more in diameter,

are not elevated, do not scale and may remain for weeks or months.

The second form occurs as a diffuse pigmentation, and is more common than the first variety. It usually begins on the sides or the back of the neck, and thence invades the chest and back for a short distance. The color varies in different subjects, from a light *café-au-lait* to a light brown or even brown hue. Upon the surface of a patch appear several small, round, oval or irregular white spots; these increase slowly, in some cases becoming whiter than the normal skin, while in others they are of the same color.

This condition lasts for several months, then disappears, leaving the parts in a perfectly normal condition.

The third form consists of an abnormal distribution of the pigment of the skin, and is the least common of all.

The normal color of the integument becomes white, in spots of irregular size and shape; the spots are surrounded by a dark border, which becomes deeper in color as the white spots increase. After a period of several months the skin resumes its normal color.

The lesion may appear as early as the second or third month, but usually occurs at the sixth month and during the second or even the third year.

It is more common in females than in males, and usually appears before the thirty-fifth year; it is also quite rare in older persons.

This syphilide is generally situated upon the neck, and especially its sides, less frequently upon the forehead and face, but may also appear upon the flexor surfaces of the extremities.

MALIGNANT PRECOCIOUS SYPHILIDES.

By malignant precocious syphilides are understood certain eruptions, which, having a malignant ulcerative tendency, appear early in the course of the disease, and are accompanied by general cachexia.

Pustular eruptions, particularly the impetigo-form and the ecthyma-form syphilides, and less frequently the papular eruptions, are prone to assume these characters. Such complications generally occur in debilitated subjects and those addicted to alcoholic stimulants.

These syphilides are divided into three classes: the syphilide puro-crustacée ulcéreuse, the syphilide tuberculo-crustacée ulcéreuse, and the syphilide tuberculo-ulcérante gangréneuse.

The syphilide puro-crustacée ulcéreuse is a pustular eruption, accompanied by ulceration and crust-formation. It commences as pustules, which ulcerate and form greenish-black crusts; the ulcers are deep and have a foul purulent secretion. Beginning upon the face or scalp, it extends to the arms, and may eventually invade the entire body.

The syphilide tuberculo-crustacée ulcéreuse begins as small tubercles, which are rapidly transformed into ulcers, covered by thick crusts. Its course and situation are similar to the preceding class.

The syphilide tuberculo-ulcérante gangréneuse, also called carbunculus veneris, is a very destructive—and, fortunately, quite uncommon—syphilide.

It commences as dark-red, deeply seated tubercles, in the center of which a black slough forms; it increases in size, and is thrown off, exposing a deep undermined ulcer with foul ichorous secretion. Each tubercle is

surrounded by a zone of redness. If healing occur, a depressed, copper-colored cicatrix is left, which in time becomes white. The eruption is situated upon the face, the extremities, the shoulders and the buttocks.

The invasion is rapid, but the course of the lesion is chronic.

Preceding the appearance of these syphilides the patient has a rise of temperature, accompanied by general malaise, various neuralgic pains, loss of appetite and an anæmic appearance.

CHAPTER XXVI.

SYPHILIS OF THE APPENDAGES OF THE SKIN.

THE HAIR.

ALOPECIA is a very common manifestation of syphilis; it may be either slight or quite extensive, is rarely permanent, and runs a rapid course in some cases and a chronic one in others.

As a general rule it is unaccompanied by heat or itching. There may be no marked lesions of the scalp, or the hair follicles may be attacked by macules, papules, pustules or ulcers.

The eyebrows, the beard and the moustache, the hair of the pubes, the axillæ and that on the body generally may be involved; the eyelashes are seldom attacked, unless by an ulcerative lesion.

There are two varieties of syphilitic alopecia: first, a general thinning of the hair; and, second, loss of the hair in spots or patches of irregular size and outline.

Alopecia generally occurs about the third month of the disease, but may appear at any time before the end of the second year.

It is the result of impaired nutrition of the hair-follicles, due to the syphilitic virus. Permanent baldness results from ulcerative processes attacking and destroying the hair-follicles.

Prognosis. As a rule, the prognosis is good, provided the loss of hair has not been too extensive and the hair-follicles have not been destroyed.

THE NAILS.

Syphilitic lesions of the nails are of two varieties: first, onychia, in which the disease begins in the substance of the nail; and, second, perionychia, in which the disease commences around the nail, and finally involves it.

The course of these lesions is chronic and may be either mild or severe. They usually occur within the first two years of the disease, but may appear much later.

Onychia. In syphilitic onychia the process may be dry (onychia sicca) and limited to the nail, or the nail may be separated from its bed.

In onychia sicca the nail loses its lustre and transparency and becomes dull yellow in color. The disease may be limited by a line of demarcation, or involve the entire nail. The edge of the nail becomes thick, brittle and cracks readily; its surface is rough and marked by shallow longitudinal fissures and depressions; the surrounding epidermis is generally thick and scaly.

The diseased portion is gradually pushed forward, grows out, and is replaced by healthy nail-tissue.

Separation of the nail may be partial or complete and generally occurs in the early part of the secondary stage.

It begins at the free border of the nail and gradually creeps toward its base, the diseased area becoming greenish-brown in color. If only a portion of the nail has been destroyed, the healthy part pushes forward and covers the denuded space; but if destruction has been complete an entirely new nail is formed.

One or several nails may be affected; those of the fingers more frequently than the toes.

Perionychia. There are two varieties of syphilitic perionychia ; the non-ulcerative and the ulcerative forms.

The non-ulcerative form attacks a portion of, or the entire attached border of the nail, which becomes infiltrated and thickened ; this condition may persist until the nail loses its lustre and is marked by transverse furrows. Ulceration sometimes occurs where the skin is reflected from the nail, and extending beneath it causes it to loosen and fall off.

The ulcerative form occurs during the secondary stage of the disease. It may begin as a papule, pustule, ulceration or fissure at some part of the nail margin, and spread beneath it, secreting a foul pus. The whole nail may be destroyed, or only a portion of it ; but if the process be checked a new nail forms and pushes the old one out in front of it.

If the ulceration is severe the entire matrix becomes involved ; the nail is thrown off, leaving a yellowish surface, surrounded by an ulcerated and inflamed border. In such cases the entire phalanx is swollen.

Unless the ulcerative process has been too severe, a new nail is produced, which, after a little time, may become quite as good as the normal one.

There is sometimes a local necrosis of the nails, which become white in spots about the size of a pin's head ; these are finally depressed and extend to the matrix, leaving sharply cut holes in the nail.

CHAPTER XXVII.

SYPHILIS OF THE MUCOUS MEMBRANES.

ERYTHEMA.

Erythema of the mucous membranes may occur at any time during the course of syphilis, particularly in the first months; it is similar to that of the skin, but is modified by the moisture and irritation to which mucous membranes are subjected. It most frequently involves the fauces and pituitary membrane.

There may be a simple redness of the mucous membrane without swelling, or redness with œdema of the parts. In the more advanced cases the mucous membrane has a milky appearance, its epithelium becomes detached in spots, thus causing erosions of the surface, which in some cases is dry, while in others it is covered by an abundant secretion.

MUCOUS PATCHES.

Mucous patches, also called mucous papules, consist of flat or slightly convex pearl-colored elevations, whose surface resembles mucous membrane, and whose secretion is highly contagious.

They are situated on the inside of the cheeks, particularly at the angles of the mouth, upon the lips, the tongue, the gums, the uvula and the tonsils, at the openings of the nares, on the pillars of the fauces, the hard and soft palate, and upon the conjunctiva and the umbilicus.

They are one of the earliest and most frequent secondary manifestations of syphilis. This lesion consists of a hyperplasia of the papillæ and a proliferation of cells in the mucous layer; the epithelium on the surface of the patch may remain intact or become detached, the surface being depressed by ulceration or raised by further development of the papillæ.

Uncleanliness, irritation, heat and moisture favor their development, as does also the use of alcohol and tobacco.

Mucous patches readily ulcerate when exposed to friction from the clothing or opposed surfaces of integument, and, unlike the other syphilitic eruptions, they are frequently attended by pruritus.

Mucous patches within the mouth are of a grayish-white color, looking as if the mucous membrane had been touched with nitrate of silver or pure carbolic acid. They are irregular in outline, and, as a rule, not elevated; when situated upon the tonsils, they usually ulcerate, owing to the constant friction to which these organs are subjected.

Their course is exceedingly chronic and they are very apt to recur, especially in those who use tobacco or alcohol.

CONDYLOMATA.

Condylomata are nothing more than exaggerated mucous patches, which from their situation upon the integument around the anus and genital organs are altered in appearance. They consist of round disks, either single or multiple, of a reddish or grayish color, with granular surface and elevated above the surrounding parts. They begin as small red spots, whose epi-

dermis, being removed by friction, leaves a moist grayish surface, which is finally converted into an elevated wart-like disk, with offensive and highly contagious secretion.

CHAPTER XXVIII.

SYPHILIS OF THE DIGESTIVE ORGANS.

THE MOUTH.

Erythema is usually limited to the neighborhood of the fauces, and associated with œdema, especially of the uvula and velum.

Mucous patches are most frequently situated upon the tonsils, the uvula, the velum palati and its pillars, the sides of the tongue, the inner surfaces of the lips and cheeks, and at the angles of the mouth. Less frequently they are observed upon the gums, and the dorsum and sides of the tongue.

Papules and vesicles. Papules may occur in the mouth during a general papular eruption, but vesicles are very rare in this situation, owing to the constant moisture and friction, which prevent their formation.

Near the angles of the mouth, especially in habitual smokers, are frequently seen patches called plaques des fumeurs. They consist of an accumulation of epithelial cells, which become whitish in color, and in some instances fissured or eroded.

THE TONGUE.

Secondary lesions of the tongue consist of erythema of its mucous membrane, mucous patches and fissures. They yield readily to appropriate treatment, but are very liable to recur, especially in smokers and drinkers.

Erythema of the tongue may involve the entire organ, or be limited to patches, which are scattered over its surface.

Mucous patches are usually situated upon the sides or tip of the tongue, and resemble similar lesions situated on other mucous membranes.

Fissures of the tongue are the result of erythema or mucous patches, and are usually situated on its sides or dorsum.

Sclerosis of the tongue usually develops about the fifth year of the disease. It occurs upon the dorsum, near the median line, and is either superficial or deep in character.

Superficial sclerosis involves only the mucous membrane, and produces a "parchment" induration. It is either circumscribed or diffuse, and ulcerates only when injured by the teeth or irritated by alcohol and tobacco.

Deep or parenchymatous sclerosis attacks the mucous and muscular tissues. The tongue may be greatly increased in size, but after a time the newly formed fibrous tissue retracts and the organ becomes atrophied. The edges of the tongue receive the markings of the teeth, while the body is lobulated. The lobules are separated by furrows which cannot be effaced. Ulceration may ensue from irritation or injury.

Gummata are later lesions, and may be either superficial or parenchymatous. In some cases they show a marked tendency to become malignant, which fact must be appreciated in their prognosis and treatment.

Superficial or mucous gummata commence as small nodules, which soon soften and ulcerate. The ulcer has

perpendicular walls, infiltrated base, and its floor is covered with a yellowish-white film.

Parenchymatous gummata begin as small nodules in the muscular tissue of the tongue; they undergo degeneration and finally the mucous membrane covering them ruptures, leaving a deep cavity, with sloughing undermined walls and surrounded by an indurated, areola.

The differential diagnosis between syphilitic ulcers or tumors of the tongue and those of non-specific origin is very important and oftentimes difficult.

The initial lesion is usually situated at or near the tip of the tongue, is single, surrounded by induration and the lymphatic glands in anatomical connection are markedly enlarged and as a rule do not suppurate.

Gummatous tumors are insidious in their origin, chronic in their course and generally free from pain. They are situated upon the dorsum and posterior half of the tongue near the median line. The lymphatic glands are rarely affected and the functions of the tongue are not interfered with.

Gummatous ulcers are usually multiple and situated upon the dorsum. The floor is sloughy and slightly vascular and the edges are undermined. Ganglionic enlargement is rare. They cause some pain.

The above lesions are all benefited by anti-syphilitic treatment and the previous history aids greatly in making a correct diagnosis.

Tubercular ulcers of the tongue are painful; they are situated at or near its tip, or any part of the dorsal surface; they are generally single, but may be multiple. The lymphatic glands may or may not be affected.

The ulcer has bevelled edges, flabby granulations and is not surrounded by induration. The microscope shows tubercle bacilli.

Carcinoma. The ulcer is single, very painful and situated on the borders and anterior half of the tongue; its edges are raised and hard and the surrounding tissues are thickened. The floor is very vascular, bleeds readily and secretes an ichorous pus. The functions of the tongue are interfered with. The lymphatic glands are always enlarged. The microscope shows cancer cells.

NECROSIS OF THE MAXILLARY BONES.

This manifestation of the disease is most frequently seen in the hard palate and the alveolar process of the superior maxillary bones.

When the hard palate is affected an abscess forms on the roof of the mouth near the median line; it finally ruptures and reveals exposed bone. After separation of the sequestrum an opening is left between the nose and the mouth, which greatly interferes with articulation and deglutition.

Necrosis of the alveolar process occurs in the upper jaw near the central incisors, and as the disease extends the teeth loosen and fall out.

GUMMY TUMOR OF THE SOFT PALATE.

In this affection premonitory symptoms are insignificant or entirely absent. Suddenly the voice becomes transformed into a nasal whisper, and attempts at swallowing liquids or solids are followed by their regurgitation through the nose.

The lesion commences in either of two ways: first, a circumscribed deposit of gummy material takes place between the buccal and nasal surfaces of the soft palate; second, there is a diffuse infiltration of the entire velum, its mucous membrane becomes reddened and its mobility impaired. Rupture of the abscess or ulceration of the infiltrated tissue may involve one or both mucous surfaces, thus causing partial or complete perforation of the soft palate with its concomitant symptoms, such as regurgitation of the food and nasal articulation. As the process of repair commences, the opening gradually contracts until it is greatly diminished in size or completely occluded.

THE PHARYNX.

Erythema, superficial ulcers and deep ulcerations resulting from the degeneration of gummatous tumors may be observed; mucous patches are extremely rare in this region.

The posterior portion of the lateral walls is most frequently attacked. Gummy tumors have been seen upon the vault of the pharynx and on the upper part of its posterior wall. The lesions encountered in this region are similar to those observed in the mouth.

THE ŒSOPHAGUS.

Syphilitic ulceration of the mucous membrane of the walls of the œsophagus sometimes occurs, and as the ulcers heal their cicatrices contract, thus forming stricture of the tube, which, becoming narrowed, interferes with deglutition, and, therefore, with the proper nourishment of the patient, who becomes emaciated and

feeble. True syphilitic gummata have also been found in the œsophageal walls.

THE STOMACH AND INTESTINES.

Accompanying the appearance of the early secondary manifestations is sometimes seen a functional disturbance of the digestive organs, such as loss of appetite, nausea and vomiting. The existence of syphilitic erythema of the stomach and intestines has not been demonstrated, although ulcerations of the mucous membrane of these viscera, possibly due to degeneration of gummy deposits, have been observed at post-mortem examinations.

THE RECTUM.

For syphilitic affections of the rectum I quote literally from Prof. R. W. Taylor, who says:

"Syphilis attacks the rectum in three distinct forms: first, early or rather late in the course of the disease by the extension of indurating œdema, which may accompany infiltrating or ulcerating lesions, and which tend to the production of more or less complete rings of connective tissue; second, by the formation of true gummatous infiltration; and, third, by the development of a form of inflammation, with the production of new connective tissue, in which congestion and exudative products are absent. This third form is a chronic productive or cellular inflammation of slow invasion and of persistent nature."

Stricture of the rectum may follow any of these three forms, but is most liable to occur after the first and third variety of the disease.

THE LIVER.

The liver is invaded by syphilis more frequently than any other abdominal organ. Congestion of the liver sometimes occurs in the secondary stage of the disease, and is usually associated with a cutaneous eruption; it generally lasts for from one to several weeks.

The symptoms are icterus, gastric disturbances and febrile reaction, the organ being sensitive on pressure. This condition is probably due to the extension of a specific catarrh of the intestine to the liver, by way of the ductus communis choledochus.

The tertiary forms of syphilitic affections of the liver are: amyloid degeneration, peri-hepatitis and hepatitis, of which there are two forms, the diffuse and the gummatous.

The symptoms are often obscure; the organ may be increased in size and nodules felt upon its surface. Pain may be present or absent. The functions of the organ are not interfered with unless the tumors are numerous. In severe cases there are icterus, gastro-intestinal disturbance and clay-colored stools.

THE SPLEEN.

In rare cases enlargement of the spleen occurs early in the course of syphilis. The swelling is quite rapid, usually painless, but may give rise to a feeling of weight. It generally subsides in three or four weeks, but may remain several months, and is liable to occur at any time during the secondary period.

Gummata of the spleen are either single or multiple, and vary in size from that of a millet-seed to a walnut;

they may be deeply seated or upon the periphery of the organ.

THE PANCREAS.

Specific affections of the pancreas are very rare, but it cannot be denied that, like the other viscera, it is subject to the diffuse and circumscribed lesions of syphilis.

CHAPTER XXIX.

SYPHILIS OF THE RESPIRATORY ORGANS.

THE NOSE.

The mucous membrane lining the nose may be the seat of erythema, mucous patches and ulcerations. The symptoms of these lesions resemble those of ordinary catarrh.

In the later stage of syphilis deeper ulcerations may occur, which originate in gummous infiltration of the submucous tissue, and may finally involve the adjacent cartilages and bones, thus leading to serious deformity of the organ from destruction of its framework.

THE LARYNX.

Laryngeal lesions are very variable as regards their time of appearance and the severity of their symptoms. The invasion is usually insidious, and the course chronic and painless.

The secondary or superficial lesions consist of erythema, mucous patches, superficial ulcerations, chronic inflammations and vegetations.

The tertiary or deep lesions comprise deep ulcerations, gummata, inflammation and necrosis of the cartilages.

Erythema of the larynx causes some huskiness of the voice and slight catarrh. It occurs during the course of the early skin eruptions, and is either diffuse or circumscribed; superficial erosions do sometimes occur.

Superficial ulcerations involve only the mucous membrane. Their margins are sharply defined, regular and slightly elevated, and the floor is covered by a tenacious secretion. They may interfere with phonation to a more or less marked degree.

Mucous patches generally occur from one and a-half to twelve months after infection, and may be situated upon any portion of the mucous membrane. If exposed to irritation during respiration or phonation they become prominent, with ragged margins.

Chronic inflammation may appear early, or not until the third or fourth year of the disease. It is a very persistent affection, and usually leads to a thickening of the mucous membrane. Chronic ulcers are always associated with this condition.

Vegetations may spring from the margin of an ulcer or from the mucous membrane itself.

In the later stages of syphilis deep ulcerations occur and generally begin in degenerated gummata. Extensive regions may be destroyed in this manner. Very frequently vegetations arise from the ulcers.

Gummy tumors of the larynx are quite common; they are either single and large or multiple and small.

The deposit sometimes undergoes absorption, but most frequently degenerates, forming deep, ragged ulcers, which may attack the framework of the larynx and produce permanent deformity.

These lesions are liable to cause an impediment to respiration, either from their size or from causing acute œdema of the larynx.

Perichondritis is usually caused by an extension outward of an inflammatory or ulcerative process from the

mucous or submucous tissue. The cartilages themselves may be invaded by the process and partially or totally destroyed.

Necrosis occurs in cases in which the cartilages are ossified and is a very late manifestation. It follows perichondritis quite frequently.

THE TRACHEA.

Syphilitic lesions of the trachea are rare, but may be similar to those which attack the larynx.

Ulcerative processes following gummatous infiltration are the most common and sometimes result in stricture from the contraction of their cicatrices.

The principal symptoms of tracheal syphilis are cough, purulent expectoration and dyspnœa. If stenosis of the tube occur its most common seat is just above the bifurcation.

THE BRONCHI.

Specific ulceration may attack the bronchi and give rise to subsequent stricture.

THE LUNGS.

The pulmonary lesions due to syphilis consist of indurations and gummy tumors.

Syphilitic induration usually affects a small extent of the middle or lower lobes and rarely involves an entire lobe; it may be disseminated at various points. The diseased portion of lung becomes firm, elastic and furrowed, while the contained bronchi are flattened and the surrounding pleura more or less thickened.

Gummy tumors may be single or multiple, and re-

remble those situated in other organs. They are not at all common, but occur more frequently than syphilitic induration. They undergo degeneration from the center outward, leaving cavities with white fibrous walls.

In some cases syphilitic lesions of the lungs cause no symptoms; in others there is a slight disturbance of respiration, and in others there are cough, pain, expectoration and all the symptoms of phthisis except the temperature, which rarely goes above 101° F. The majority of these cases yield readily to specific treatment.

THE PLEURA.

During the secondary stage of syphilis patients quite frequently complain of pain in the chest, which is associated with more or less rise of temperature and a moderate amount of effusion into the pleural cavity. This early form of pleurisy yields readily to antisyphilitic treatment.

CHAPTER XXX.

SYPHILIS OF THE ORGANS OF CIRCULATION.

THE HEART.

TERTIARY syphilis attacks the heart in two ways: first, by chronic inflammation; and, second, as gummy tumors.

Endocarditis occurs about the end of the second year, and is usually associated with myocarditis; most frequently it attacks the left ventricle at the apex or base of the organ. Gummy endocarditis attacks any and all parts of the heart, giving rise to tumors of various sizes. Pericarditis usually follows myocarditis, and attacks either the visceral layer or the entire pericardium.

Gummy tumors of the pericardium are rare, and usually result from myocarditis.

The symptoms of cardiac syphilis may be absent in some cases and very obscure in others. The action of the heart becomes irregular and feeble, and the patient suffers from palpitation, dyspnœa, cyanosis and pain over the region of the organ.

THE BLOOD VESSELS.

Syphilitic affections of the veins and capillaries are very rare. The arteries may be attacked primarily, or secondarily to specific disease of the surrounding tissues. Primary lesions generally occur in the small arteries of the brain.

The symptoms depend upon the situation of the

lesion. If the cerebral arteries are attacked there are severe headache, paralysis with or without coma, aphasia and muscular spasms. In fatal cases these are followed by delirium and epileptiform convulsions, with fever.

If the carotid artery be affected there are cerebral impairment, pain in the head and epileptiform seizures.

In affections of the arteries the calibre of the vessel is reduced, and sometimes occluded, by a new, dense, cellular formation in the internal coat, which resembles granulation tissue, and, finally becoming organized; this new formation involves the entire circumference of the vessel, and extends outward as well as inward, invading both the middle and external coats. It occurs in patches, which are generally single; a thrombus may form on the patch, become organized, and thus obstruct the lumen of the vessel.

In some instances the changes in the artery are very slight, the process being limited to the internal coat; in others the vessel is thickened, rigid and nodulated in appearance.

The disease most frequently affects the carotid and its branches, especially the middle cerebral.

The lesion may occur as early as the first year or as late as the twentieth, but as a rule appears about the third year after infection.

CHAPTER XXXI.

SYPHILIS OF THE GENITO-URINARY ORGANS.

EPIDIDYMITIS.

Syphilitic epididymitis may occur as early as the second month or as late as the fifth year, but generally develops within the first six months of the disease. It is more commonly unilateral and as a rule it attacks the globus major. Its invasion is usually unattended by any symptoms, except occasionally, when there is a slight sense of uneasiness in the part.

The lesion consists of a smooth, hard, round or oval and non-painful tumor, situated just above the testicle, which is about the size of a pea, or in some instances larger. It shows no degenerative tendency and quickly disappears under antisyphilitic treatment. The scrotum remains unaffected.

ORCHITIS.

Syphilitic orchitis is sometimes observed as early as the fourth or fifth month, but in the majority of cases it is a tertiary manifestation and appears several years after infection.

One or both testicles may be involved, either at the same time or consecutively. The body of the organ becomes increased in size, hard, heavy and painless and there is more or less hydrocele of the tunica vaginalis.

At the beginning of the disease there may be little

projections upon the surface of the testicle, due to syphilitic deposits, which, as the process progresses, fuse together, forming a hard tumor, resembling almost exactly the shape of the normal testicle. In other cases the surface of the tumor is perfectly smooth.

The course of this affection is very slow. If untreated, it may result in partial or complete atrophy of the organ, or the parenchyma of the gland may degenerate into fibrous, cartilaginous or even osseous tissue. As a general rule, suppuration does not occur.

The lesion may be diffused or circumscribed.

In the diffuse form the whole organ is increased in size, firm, hard and resistant and unless treated results in atrophy. There is also a certain amount of hydrocele.

In the circumscribed form gummy material is deposited in masses through the testicle. These masses have a tendency to undergo secondary degeneration and softening, thus causing inflammation and ulceration of the surrounding tissues, finally leading to syphilitic fungus of the testicle.

It yields readily to treatment if recognized at an early period.

The vas deferens usually remains normal in syphilitic orchitis, although it may be involved; this is true also of the vesiculæ seminales and prostate gland.

THE PENIS.

Deposits of syphilitic material may occur in the penis, especially near the sulcus behind the glans and are also to be found in the corpora cavernosa.

These deposits gradually increase in size without

giving rise to any pain, but soon cause deformity of the organ, especially during erection.

THE OVARIES.

Syphilitic affections of the ovaries resemble those of the testes, but are rarely encountered. The symptoms are slight pain and increase in the size of the organs, with loss of the sexual appetite and sterility.

The Fallopian tubes are not involved. Cases are reported in which the uterine tumors in syphilitic subjects have disappeared under antisyphilitic treatment, thus showing that this organ may also be the seat of late syphilitic manifestations.

Exulcerative hypertrophy of the neck of the uterus consists of an enlargement and hardening of the os, which becomes congested and ulcerated, the secretion from the ulcer being contagious, scanty and mucopurulent in character. This lesion begins about the eighth week after infection, runs a chronic course, but responds readily to internal, mercurial and local treatment.

THE KIDNEYS.

In the kidneys of syphilitic subjects the same lesions are met with as occur in the other organs, such as interstitial nephritis, gummy tumors and cicatrices, which latter result from the preceding affections.

CHAPTER XXXII.

SYPHILIS OF THE NERVOUS SYSTEM.

Syphilitic affections of the nervous system are very numerous and of frequent occurrence; they may appear as early as the third month or as late as the twentieth year after infection, and are more frequent in men than in women. Nervous phenomena are more apt to occur in neurotic subjects and those addicted to alcoholic excesses, also in those who have not received the proper treatment for a sufficient length of time.

Lesions of the bones. Lesions situated on the inner surface of the skull or vertebræ may, by the pressure they exert, cause inflammation of the meninges and secondary changes in the brain or cord. These lesions may be nodes, exostoses or necrosis.

Affections of the dura mater. The dura mater is very susceptible to syphilitic invasion. The changes produced in it are increase in thickness, roughening of its inner surface and increased vascularity. It may be affected alone or the disease may extend to the inner surface of the skull and the arachnoid, or the dura mater may be secondarily involved by processes beginning in the pia mater and arachnoid.

The syphiloma may be diffuse or circumscribed. Syphilomata of the spinal dura mater resemble those of the cerebral in origin and course.

Affections of the arachnoid and pia mater consist of congestion and enlargement of the vessels, with increase

of connective tissue and thickening. Sometimes gummatous infiltration occurs giving rise to a gummous meningitis.

The lesion may invade the dura mater and the bones of the skull and is probably the most frequent syphilitic lesion. It occurs in patches, which are sharply circumscribed and either single or multiple.

Affections of the brain and cord are always secondary to lesions of the bones, meninges or vessels and consist of red and white softening.

Affections of the nerves. The cerebro-spinal nerves may be invaded by the lesions of the meninges or they may be surrounded by gummata or compressed as they pass through bony canals.

The third pair are most often affected.

There may be a neuritis and perineuritis.

The peripheral nerves are affected in a similar manner.

The sympathetic nerves may be invaded in either one or two ways: first, by pigmentary or colloid degeneration of the nerve-cells; and, second, by sclerosis of the connective tissue, causing atrophy of the nervous elements.

SYPHILITIC TUMORS OF THE NERVOUS SYSTEM.

Two forms of syphilitic tumors occur in the cranio-vertebral cavity; they are usually connected with the cerebrum, but rarely found in the medulla, cord or cerebellum.

The first form is grayish-red in color, highly vascular and either firm or soft in consistence. It consists of small, round cells in a stroma of connective tissue.

The second form, which is really a degenerating stage of the first, is yellow in color and hard.

These tumors may be single or multiple and vary in size from that of a pea to a walnut.

They occur chiefly on the under surface of the brain, near the Sylvian fissure, and as a rule are peripheral; but if found in the brain-tissue it will be observed that they have grown in from the vascular membrane.

HEMIPLEGIA.

Specific hemiplegia is a very frequent symptom of cerebral syphilis.

It may occur as early as the third month or as late as the twentieth year after infection and is usually preceded by localized headache, vertigo and convulsions. Sometimes there are muscular spasms, pains or numbness in the parts which afterward become paralyzed.

The invasion is either gradual or sudden and usually comes on when the patient is engaged in some muscular effort or is in bed at night.

If the paralysis be partial it may gradually improve, or even disappear, or, as improvement takes place, the opposite side may be similarly affected.

In rare cases there is a loss of both motion and sensation; this may be accompanied by paralyses of various nerves, aphasia, mydriasis, optic neuritis and epilepsy. Some patients suffer from mental depression, while others are very emotional.

EPILEPSY.

Syphilitic epilepsy occurs in two forms: first, the grand mal; and, second, the petit mal.

It is a very frequent manifestation of cerebral syphilis, and is always preceded by severe headache.

The symptoms of the severe form consist of sudden loss of consciousness, tonic and clonic spasms, facial distortion, foaming at the mouth, and stentorous respiration; the aura and epileptic cry are not always present. These convulsions generally occur at short intervals and with well-marked regularity; some patients regain consciousness in a few minutes, while others remain in a stupid condition for hours.

The mild form begins with twitching of the muscles of one side of the face, turning of the tongue to one side, a tendency of the subject to turn around, giddiness, general trembling or great weakness, or cramps in the extremities, loss of consciousness, and a convulsion. The seizure may be confined to a single limb or one side of the body. Very often there is no spasm; the patient loses consciousness and stares vacantly into space; this condition lasts a few moments or even several minutes.

PARAPLEGIA.

The spinal cord is not so frequently attacked by syphilis as is the brain.

The causes of syphilitic paraplegia are lesions of the vertebræ, of the spinal meninges and gummata which press upon the cord.

The symptoms consist of a varying amount of pain in the back, weakness of the lower extremities, darting pains in the legs, numbness, tickling or aching pains in the feet, with hyperæsthesia or anæsthesia. Loss of co-

ordination is sometimes observed. The expulsive force of the bladder and rectum is weakened.

A patient may remain in this condition for a long time, but unless properly treated complete paralysis of both lower extremities finally comes on. General sensation may remain, or be somewhat impaired or lost.

Paraplegia is a later manifestation of syphilis than hemiplegia or epilepsy, and generally occurs after the sixth year of the disease, but may show itself much later.

APHASIA.

Disturbances of speech frequently occur during the course of syphilis of the nervous system.

There may be hesitation in speaking, or inability to remember certain words in conversation and writing, or the use of inappropriate words.

The affection is continuous or intermittent in character.

LOCOMOTOR ATAXIA.

It seems to be well established that locomotor ataxia is the result of syphilis in from 60 to 70 per cent. of all cases, but it must not be forgotten that these figures are taken from hospital and dispensary cases, and are therefore questionable, as these patients very rarely receive the proper treatment for a sufficient length of time, which neglect renders them liable to all manner of late manifestations, that are not encountered in those who receive vigorous, prompt and carefully conducted medication, especially during the early months of the disease. The symptoms and course of the disease are the same, whether it be specific or simple.

PSEUDO–GENERAL PARALYSIS OF SYPHILITIC ORIGIN.

This affection is manifested by such symptoms as cerebral excitement, gayness of spirits alternating with depression, together with delirium or even mania. The motor disturbances consist of uncertain movements without paralysis, trembling of the hands, hesitating speech and staggering gait, headache, dizziness, impairment of sight and hearing, with epileptiform convulsions.

These symptoms do not occur at the same time or in a regular manner, but appear at odd intervals.

CHAPTER XXXIII.

SYPHILIS OF THE MUSCLES.

MYOSITIS.

THERE are three forms of syphilitic affections of the muscles; first, the irritative or hyperæmic; second, the chronic irritative; and, third, in the form of gummata.

Irritative myositis usually occurs in the early stage of syphilis, and is associated with pain and soreness in the muscles, but leaves no permanent traces of its existence.

The chronic infiltrative form consists of the development of connective tissue in the interfibrillar spaces, which eventually hardens, resulting in atrophy and destruction of the muscle. Any muscle may be attacked, but the flexors of the upper extremity, and especially the biceps, are most frequently invaded.

The muscle gradually shortens without causing any pain; the patient first notices that he is unable fully to extend the limb, but no change is detected on palpation.

It generally occurs about the tenth month, but may appear earlier or later.

Its course is chronic, lasting for several months or years.

Gummy tumors. These tumors consist of circumscribed deposits of gummy material. They are usually found in the larger muscles, such as the trapezius, the gluteus maximus, the sterno-mastoid, the vastus ex-

ternus, the pectoralis major and the walls of the heart. Gummata of the tongue, palate or pharynx may originate in the muscular tissue and secondarily involve the mucous membrane.

Gummy tumors grow slowly and without inflammation; they vary in shape and size, cause no pain, but if large interfere with motion; they occur late in the disease and are accompanied by other syphilitic manifestations.

As a general rule they do not suppurate, but may become indurated and even be converted into cartilage or bone, thus accounting for the osseous masses which are sometimes found in the muscles of old syphilitics.

THE SHEATHS OF THE TENDONS, THE TENDONS AND THE APONEUROSIS.

Dorsal hygroma are firm, elastic, fluctuating tumors, which occur on the backs of the hands; they are triangular in shape, with their bases toward the fingers.

The lesion consists in a diffuse deposit of syphilitic material, with hyperæmia of the sheath and serous effusion.

They cause trifling pain, unless very large, when the skin may become tense, inflamed and painful; they grow rapidly and appear in the early years of the disease.

The tendons of the ankle and foot may be similarly affected.

Gummy tumors are sometimes found in the tendons, especially the larger ones, near their points of insertion and thicker portions. They are non-painful and may remain indolent for quite a time, then break down and form ulcers.

Tumors of the aponeuroses are more diffuse than those of the tendons; their course is similar, but they are not so liable to degenerate.

As a rule, they attack the firm, dense fascia of the extremities, especially the fascia lata.

THE BURSÆ.

In the secondary stage of syphilis there may be a congestion of and a serous effusion into the bursæ.

In the tertiary stage the bursæ are quite frequently attacked, especially the pre-patellar bursa.

The lesion consists of a gummous infiltration with connective-tissue formation. It begins painlessly, as a firm, hard or elastic movable tumor beneath the skin; it may remain in this condition for a long time, or acute inflammatory symptoms may set in, causing ulceration of the overlying integument, in which case the course becomes very chronic.

CHAPTER XXXIV.

SYPHILIS OF THE FINGERS AND TOES.

Syphilitic dactylitis consists of a gummy deposit in the subcutaneous connective tissue of the fingers or toes and an infiltration and inflammation of their bones.

It belongs to the tertiary period of the disease and has two varieties.

In the first variety the subcutaneous connective tissue and fibrous structures of the joints are involved, but in the second variety the process begins in the bones and periosteum attacking the joints secondarily.

In the first variety the lesion comes on slowly and the patient's attention is first attracted by the enlargement of the finger or toe, which increases in size and becomes harder. The toes are generally affected in their entire length; but when a finger is attacked the lesion is usually limited to a single phalanx, although the whole member may be included.

The finger or toe becomes red in color, resistant and tense; the swelling is most marked on the dorsal aspect and ends abruptly at the metacarpo-phalangeal articulation; it comes on slowly, and may or may not be painful. Symptoms of joint-implication appear within a few weeks; flexion is impaired by the swelling; and if such a condition be left untreated, the joint finally becomes abnormally mobile; sometimes there are hydrarthrosis and crepitation between the articular surfaces. This process may be limited to one or several members, is

a late manifestation of the disease, and runs a chronic course.

The second form is limited to the bone, and is due to a specific periostitis or osteomyelitis. Its course is either rapid, slow or intermittent. In the majority of cases the whole bone is involved, but the disease may be limited to the extremities of two opposing phalanges. The proximal phalanx is more commonly involved than the distal one, and the fingers are more frequently attacked than the toes.

The process may affect several phalanges or fingers. The metacarpal and metatarsal bones can be attacked at the same time, or separately, but the metacarpal bones of the thumb and index finger are most frequently involved.

The integument is but little affected, unless the swelling is considerable, when it becomes tense and thin ; in some cases ulceration takes place, the inflammatory focus always being on the side of the finger. Necrosis of the bone may occur, but, as a rule, resolution of the osseous swelling is the result. In about a month bony crepitation may be detected, owing to erosion of the articular cartilages. Effusion into the joint sometimes occurs, but is not serious, as the fluid is usually absorbed. The mobility of the articulation may be impaired or rendered too free. The shaft of the bone is either shortened or slightly elongated, but ordinarily the deformity is not marked. The tendons and their sheaths are not implicated. Pain is very slight or entirely absent.

This affection usually appears between the fifth and fifteenth years of the disease.

CHAPTER XXXV.

SYPHILIS OF THE BONES, CARTILAGES AND JOINTS.

PRECOCIOUS OSSEOUS AFFECTIONS.

Osseous lesions may occur in the early months of the disease, but are usually late manifestations.

The bones of the cranium, the ribs, the sternum, the clavicle and the tibiæ are the most liable to be affected early. Of the skull, the frontal and parietal bones are the ones usually attacked.

The nodes or swellings vary in size from half an inch to an inch and a half in diameter, and may be half an inch in height; they are single or multiple, round, smooth and hard. Similar lesions are liable to form on the inner surface of the cranium, and give rise to cerebral symptoms.

The clavicle is generally attacked at its sternal extremity, the articulation being involved in some instances.

The upper third of the sternum is more frequently affected than the lower; the lesion may attack its borders and costal cartilages, and in this way set up a localized pleurisy. In severe cases the ribs are also invaded. Nodes are usually situated upon the subcutaneous surface of the tibia. The radius and ulna may be attacked, generally near the joints, the wrist more frequently than the elbow.

These tumors grow very rapidly, and are always accompanied by pain which is worse at night.

The lesion is due to hyperæmia of the periosteum and new fibrous-tissue formation.

The nodes rarely break down into ulcers, but tend rather to spontaneous involution. They yield readily to treatment, or, if left alone, are converted into bony masses.

These lesions are generally accompanied by others of the secondary stage, and may occur even before the disappearance of the initial lesion.

LATE OSSEOUS LESIONS.

These lesions do not necessarily occur in every case of syphilis. They may appear with the late secondary lesions or when every trace of the disease has disappeared.

Osteo-periostitis. In this affection the lesion consists of an increased vascularity of the periosteum and the underlying bone with an effusion and infiltration of either a fluid or gelatinous substance.

Any of the bones may be affected, but especially the tibia, the ulna, the clavicle, the sternum and the cranial bones.

The process causes soft tumors of variable size gradually shading into the surrounding tissues, attached to the bone but not to the skin; sensitive on pressure and painful, especially at night. Such tumors are called nodes.

Under appropriate treatment the nodes undergo resolution; otherwise the skin becomes red, thin and adherent to the tumor, which breaks down into an ulcer; this results in superficial necrosis with an adherent cicatrix.

In other cases the effusion is transformed into bony issue constituting an exostosis which, being movable

upon the bone beneath, is called an epiphysary exostosis; this form is due to periostitis, and such exostoses are generally small and thin. Resolution is no longer possible; the tumor remains and is not influenced by treatment.

In another set of cases syphilitic exostosis is the result of ostitis, which results in hypertrophy of the normal bone; this form is called parenchymatous exostosis, and the new formation is made up of either compact or cancellated tissue.

Exostoses may be situated on the inner surfaces of the cranial bones and give rise to very serious cerebral symptoms. The frontal bone is most frequently affected in this manner. In rare instances exostoses are found in the vertebra, sometimes external and sometimes within the spinal canal.

Osteomyelitis. The deposit of syphilitic material generally takes place in the medullary canal of the long bones, but may occur in the periosteum or even in the substance of the bone itself.

The bones of the head are also liable to be affected, the syphilitic deposit occupying the diploë, thus separating the internal and external plates of the skull and leading to caries or necrosis of them, and frequently to perforation, either internally or externally.

These lesions are generally confined to the bones of the head, the nose, the hard palate and the alveolar process of the upper jaw, but the long bones may also be similarly affected.

THE JOINTS.

The joints are quite frequently involved during the secondary and tertiary stages.

Arthralgia. Pain in the joints is frequently an early manifestation.

The lesion is a specific inflammation of the synovial membranes and fibrous tissues. The skin remains normal in all respects and there is no effusion into the joint; the only symptoms being pain, with sometimes slight stiffness of the articulation. The pain, which varies greatly, generally becomes worse at night.

Any of the joints may be attacked, but generally the larger ones, usually the knee.

In some cases the cartilages are invaded, giving rise to crepitation.

Synovitis. There are two varieties of syphilitic synovitis; the first is a chronic effusion into the joint, without change in its structures; the second consists of effusion with thickening of the synovial membrane.

The first variety occurs in the early stage. The affection begins slowly and painlessly and consists of an effusion and some stiffness of the articulation. The integument is not involved. The effusion may be slight or copious, and is intermittent in character; in some cases it is absorbed gradually, while in others it becomes chronic and very persistent. Suppuration or destruction of the joint does not occur.

During this process firm pressure may elicit some pain, otherwise there is none.

The second variety occurs late in the secondary and during the tertiary stage. The affected joint becomes slightly painful, enlarged and its motion impaired. The effusion takes place slowly and is accompanied by thickening of the synovial membrane and fibrous tissue.

The lesion is due to gummy infiltration into the

synovial membrane. In some cases the cartilages become more or less eroded, thus giving rise to crepitation. There is but little tendency to complete ankylosis.

The knee-joint is the one most frequently affected.

The prognosis is good if the patient has suitable treatment at an early period.

CHAPTER XXXVI.

SYPHILIS OF THE EYE.

THE ORBITAL BONES.

The bones of the orbit may be attacked by either periostitis, caries or necrosis and present the same general symptoms as do similar lesions in the other bones.

The inflammatory process may extend from the diseased bones to the contents of the orbit, causing a cellulitis, which, if untreated, is liable to result in abscess and partial or complete destruction of the organ.

These lesions usually attack the orbital plate of the frontal and lachrymal bones.

Syphilitic nodes can form upon any of the four walls of the orbit and, if deeply situated, cause protrusion of the eye, with more or less interference of vision.

THE LACHRYMAL PASSAGES.

Affections of the lachrymal passages may occur at any period of the disease.

In some cases they are limited to the mucous membrane and submucous tissue and consist of catarrhal inflammation with œdema and ulceration. In the majority of cases the process begins in the bones or periosteum and involves the mucous membrane secondarily.

Symptoms. As the lachrymal passages become impervious, the tears collect upon the conjunctiva and flow over the face ; purulent matter forms in the lachrymal

sac and regurgitates into the eye, causing conjunctivitis and inflammation of the puncta lachrymalis. If the process be very severe, an abscess may form in the lachrymal sac.

THE LACHRYMAL GLAND.

Very few cases of affections of this gland have been reported.

The gland becomes swollen, pushing the upper lid forward, which in turn may become red and inflamed, but gives rise to no pain.

The trouble subsides rapidly under anti-syphilitic treatment.

THE EYELIDS.

Affections of the eyelids are not at all common; they are divided into eruptions, ulcerations and infiltrations.

Eruptions may occur upon either the external or the internal surface of the lid, in the form of papules or pustules.

Ulcerations. The initial lesion may be situated upon any part of either surface of the lid, but most frequently occurs at its free margin.

Beginning as a papular or superficial ulcer, it is soon surrounded by well-marked induration with enlargement of the pre-auricular glands.

In the secondary period lesions of the lids occur as small, elevated, circumscribed spots of a grayish-red, yellow or copper color.

Mucous patches are sometimes found upon the palpebral conjunctiva and resemble those situated elsewhere.

Ulcerations of the eyelid during this period generally commence as gummy tumors or submucous infiltrations. They cause great destruction of the tissues and are generally situated upon the border of the lid.

Infiltrations between the cartilages and the integument do not always ulcerate, but may remain for a long time as nodules, which disappear under proper treatment.

The tarsal cartilages may become inflamed and thickened, causing œdema of the lid, with or without redness of the integument.

The affection is very chronic and results in the loss of elasticity of the cartilage.

The tendons and fasciæ of the muscles of the eye may also be involved in the general specific inflammation, which is apt to lead to abscess-formation and consequent destruction of the organ.

THE CONJUNCTIVA.

The ocular conjunctiva is rarely affected by syphilitic lesions, but may be the seat of tubercles, gummy tumors and gummatous infiltration. Cases of papules and blotches have been observed coincidently with a general eruption; the initial lesion is sometimes situated here.

Secondary ulceration may occur near the margin of the cornea; and begin as red, elevated spots, which soon ulcerate and are liable to extend to the cornea.

THE CORNEA.

Syphilitic ulceration of the cornea is a very rare manifestation. When inflammation does occur it is usually

in the substance of the cornea, and designated as parenchymatous keratitis, of which there are two forms: the diffuse and the punctate.

Diffuse keratitis is generally accompanied by a varying amount of pericorneal injection and slight grayish opacity of the cornea, which after a time gives it the appearance of ground-glass. As a rule, there is not much pain or photophobia at first, but these symptoms gradually increase in intensity and are accompanied by lachrymation.

Diffuse keratitis is the form generally observed in young children and is almost always due to hereditary syphilis.

Punctate keratitis. The opacity occurs in sharply limited spots or points, which as a rule do not coalesce.

The lesion is gray or yellow in color and deeply seated.

THE SCLEROTIC.

Affections of the sclerotic coat are divided into episcleritis and parenchymatous scleritis.

Episcleritis generally begins as a hyperæmic spot near the margin of the cornea, which, as the inflammation continues, becomes violet or purple in color. The conjunctiva is seldom involved, and then to a limited extent only. Any part of the cornea can be affected, and several spots may form at the same time and merge into each other.

There is usually but little pain, photophobia or lachrymation with this process, which may in some cases invade the cornea, the iris or the ciliary body.

Parenchymatous scleritis is a very rare affection.

As a rule, it commences by a zone of injection around the cornea, which is at first pink in color, but eventually becomes purplish. This pinkish zone gradually extends backward, covering entirely the anterior portion of the ball. This affection may run a chronic, painless course, or cause photophobia, severe pain and lachrymation.

The iris may or may not be implicated.

The sclerotic coat is sometimes the seat of gummous infiltration.

THE IRIS.

Syphilitic iritis is one of the most serious affections of the eye, and should be recognized early in order that proper treatment be employed.

It usually appears during the secondary period, but may occur much later.

There are three varieties of inflammation of the iris: first, simple or plastic iritis; second, serous iritis; and, third, parenchymatous or suppurative iritis.

Simple or plastic iritis is characterized by congestion of the iris, with the production of an exudation from it, and in some cases by an increase of the connective tissue. As a rule, there is injection of the conjunctival and sclerotic vessels. The color of the iris is changed, its surface is covered by a thin layer of fibrin, and on exposure to light it reacts slowly or not at all. The pupil may become irregular in shape, owing to the adhesions between it and the capsule of the lens, or to the exudations into its substance.

Serous iritis. In this affection the exudation is serous in character, and is due to excessive secretion of turbid aqueous humor, which generally produces an in-

creased intraocular tension ; this causes deepening of the anterior chamber and dilatation of the pupil from pressure. Circumcorneal injection may be absent or present. Adhesions between the lens and the iris are very rare in this form.

Parenchymatous or suppurative iritis. In this form of iritis there is inflammation in the stroma of the iris, causing œdema of the membrane and increase in its cellular tissue-elements. Elevations, also called tubercles, or condylomata, occur upon the surface of the iris, and in composition are identical with gummy tumors. The vessels of the membrane are congested from retardation of their circulation. Adhesions between the margin of the pupil and the lens are very common. Pus is produced rapidly and abundantly in the anterior chamber.

Pain and photophobia may be very severe, or in some cases entirely wanting ; vision is always more or less interfered with.

If the affection be early and properly treated, the eye returns to its normal condition ; but in cases that are neglected, permanent adhesions form, which impede the motion of the iris.

THE CRYSTALLINE LENS.

The lens is never primarily affected by syphilitic inflammation, although secondary changes in the capsule and lenticular substance are common.

THE CILIARY BODY.

Primary cyclitis, or inflammation of the ciliary body, is very rare. It usually follows affections of the iris or the choroid.

The symptoms are intense pericorneal injection at one or more points, opposite any one of which there is retraction of the iris.

Gummata are also sometimes found in the ciliary body.

THE CHOROID.

There are three varieties of choroiditis: first, plastic choroiditis, or choroiditis exudativa; second, serous choroiditis; and, third, parenchymatous choroiditis.

Plastic choroiditis, or choroiditis exudativa, is characterized by the formation of an exudation upon the surface and in the substance of the choroid.

The exudation appears like yellowish-white or straw-colored spots, over which run the retinal vessels. These spots may be absorbed and leave no trace of their existence, but usually the exudation disappears, leaving atrophic changes in the choroid, which becomes greatly thinned and allows the sclera to be seen, thus giving a white, glistening appearance to the previously yellow spots. Serous choroiditis is characterized by the exudation of a serous material from the choroidal membrane.

Parenchymatous choroiditis consists of a deep-seated inflammation with hypertrophy of the cellular tissue, forming little gummy tumors which project into the vitreous humor.

Syphilitic choroiditis usually develops in the late secondary or the early tertiary period.

THE RETINA.

Retinitis, or inflammation of the retina, is marked by increased vascularity and opacity of the membrane, due to effusion into its substance.

It usually begins by redness of the optic nerve entrance or by slight œdema, which obscures the underlying structures. The retinal vessels become enlarged, tortuous and sometimes rupture, forming spots of ecchymosis. The deposits of lymph in the retina cause light-colored patches, beneath which pass the vessels of the choroid and the retina.

Retinitis is rather an uncommon manifestation and generally occurs quite late in the disease.

THE OPTIC NERVE.

Optic neuritis, unless following an inflammation of the retina or choroid, is very rare, but does occur.

The ophthalmoscopic appearances of specific and non-specific neuritis are the same.

THE VITREOUS BODY.

Turpidity of the vitreous is a common complication of inflammation of the choroid. It is a disputed point, however, whether the vitreous is ever the seat of primary specific inflammation.

THE NERVES OF THE EYE.

Syphilitic paralysis of the nerves of the eye is a very common manifestation of the disease and attacks most frequently the third pair, or motor oculi; next the sixth pair, or abducens; and, finally, the fourth pair, or patheticus.

Paralysis of the third pair causes ptosis, external strabismus, immobility of the ball, diplopia and mydriasis.

Paralysis of the sixth pair gives rise to internal strabismus.

Paralysis of the fourth pair is followed by a loss of power of rotation of the eyeball on the affected side.

Sometimes only certain branches of a nerve are involved, or different nerves of both eyes may be affected simultaneously.

CHAPTER XXXVII.

SYPHILIS OF THE EAR.

The external ear may be the seat of macules, papules and gummata, although their occurrence in this situation is not at all common.

The external auditory canal is sometimes, but not very commonly, the seat of mucous patches and condylomata; they are either isolated or merged together and completely occlude the canal, causing quite severe pain.

Ulcers are sometimes situated on the walls of the external meatus; they are rounded in form, very painful and chronic, and begin as circumscribed inflammations or gummy tumors which break down and suppurate.

The middle ear is that portion of the organ which is most frequently affected in syphilitic subjects on account of its intimate connection with the throat, from which any syphilitic affection may extend, and in which place syphilitic lesions are so common.

Mucous patches may be situated in the Eustachian tube or upon the walls of the middle ear.

The sequelæ of these affections are opacities or destruction of the drum, loosening of the ossicles from their attachments, or caries of the temporal bone or ossicles.

The mastoid cells may also be involved as in ordinary suppurative otitis media.

Stricture or complete occlusion of the Eustachian tube may follow an acute or severe invasion of syphilis.

Hypertrophy of the lining membrane, membranous bands, polypi or hyperplasia of the osseous tissues, cause impairment of hearing, according to their degree of development.

The internal ear. Very little is definitely known of syphilitic lesions of this portion of the ear.

In cases of severe inflammation of the tympanum there may be congestion, or even extravasation of blood into the internal ear.

Disease of the labyrinth usually appears at the end of the secondary stage and may either follow disease of the middle ear or occur primarily.

Cases of sudden deafness, due to syphilis, usually occur within the first four years of the disease, and as a rule both ears are affected simultaneously.

There is a feeling of fulness in the ear, but no pain; the patient has vertigo and sometimes a staggering gait.

The attack is preceded by hyperæmia of the drums, which afterward become opaque, lustreless and only slightly, if at all, injected; there is no sign of fluid in the middle ear. The Eustachian tube remains open and the fauces may or may not be affected.

CHAPTER XXXVIII.

PROGNOSIS OF SYPHILIS.

As a broad general rule, it may be stated that patients who are otherwise in a perfectly healthy condition experience very little trouble from syphilis, provided they have the proper treatment for a sufficient length of time and live moderate and regular lives, according to the rules laid down by the physician. It is claimed that blondes and subjects with light complexion and reddish-brown or red hair suffer more than those of dark complexion. The disease is apt to be very severe in old age and in nervous, excitable subjects. Alcoholic habits and intercurrent diseases, especially Bright's disease and tuberculosis, render the prognosis less favorable. Syphilis sometimes runs a very severe course in fat and flabby subjects, also in very thin and anæmic ones with poor muscular and chest development.

The indications of a mild attack of syphilis are a long period of incubation; a superficial initial lesion; simple erythema without papules as the first syphilide and gradual diminution in the size of the moderately enlarged lymphatic glands.

A severe attack of syphilis is usually indicated by a short period of incubation, with deep ulceration and great induration of the initial lesion; by a papular, vesicular, pustular or squamous eruption as the first syphilide; and persistency of the general glandular enlargements.

There are undoubtedly rare instances in which the disease tends to self-limitation, but one cannot always prognosticate which case will do well and which one badly; the physician must therefore be very guarded in giving his opinion, always taking into consideration the habits and general condition, and make-up of his patient.

CHAPTER XXXIX.

TREATMENT OF SYPHILITIC LESIONS.

THE INITIAL LESION.

THOROUGH cauterization, or complete excision of the initial lesion, with all of the lymphatic glands in anatomical relation with it, even if performed in a few hours after its appearance, is of no avail in aborting syphilis, as the syphilitic virus or poison travels so rapidly by way of the blood vessels and lymphatics that very distant and remote parts are infected by the time the chancre appears; for this reason, therefore, which has been demonstrated clinically and microscopically by the most competent observers, excision of the chancre as an abortive measure should be abandoned.

The local treatment consists in scrupulous cleanliness of the lesion and its protection from all sources of irritation. The patient must be told to abstain from all sexual relations, no matter how insignificant the lesion appears. The sore should be washed in bichloride of mercury solution, 1–2000 or 1–3000, morning and evening, and covered with absorbent gauze or cotton saturated in this solution; this dressing is changed every few hours, the soiled one being destroyed immediately by fire.

In the same manner may be used boric-acid solution, alum water or Red Wash.

Iodoform, or iodoform and boric acid in equal parts, are very good dusting powders if sloughing has taken

place in the sore, but the odor of iodoform is so disagreeable that it can rarely be used in private practice. Calomel, or equal parts of calomel and boric acid, may also be used in these cases. Black Wash (calomel 5j to lime water Oj) or Yellow Wash (corrosive sublimate 5ss to lime water Oj) are very serviceable dressings if suppuration occurs in the lesion.

Should a film or membrane form upon the floor of the chancre a little pure carbolic acid or nitric acid may be applied very carefully in the following manner; the sore is washed in bichloride solution 1–2000, dried with absorbent gauze, and a little carbolic acid applied by means of absorbent cotton wound on a wooden applicator. If nitric acid is used the chancre should be anæsthetized with cocaine solution, dried and surrounded with vaseline to protect the healthy tissues from the action of the acid, which is applied as above described, and the sore covered with a cold, wet bichloride dressing to allay inflammatory reaction. It must not be forgotten, however, that cauterization is very rarely required in these cases, absolute cleanliness being the essential point in the treatment.

Chancre situated beneath a long, tight foreskin that cannot be retracted, and from beneath which exudes a foul, purulent discharge, should be exposed by making two lateral incisions through the prepuce, for which operation the reader is referred to page 169.

When the chancre is cicatrized the remaining mass of induration should be kept constantly covered with 50 per cent. mercurial ointment, which in a short time will cause it to soften and disappear, leaving a purple spot, which in time fades to white.

INDURATED LYMPHATIC GLANDS AND VESSELS.

It is always well to use local inunctions of 50 per cent. mercurial ointment over all lymphatic glands and upon the parts supplied by their vessels. A different group of glands should be rubbed every night, having first washed the overlying skin with soap and water, and then a little alcohol.

THE SYPHILIDES.

The early syphilides, as a rule, require mercurial treatment alone, while those occurring later in the disease demand iodide of potassium combined with mercury.

Ulcers resulting from the pustular eruption, or any form of syphilitic ulceration, if very painful, should be touched with a strong solution of carbolic acid, washed with bichloride solution, and dressed with iodoform, calomel or bichloride of mercury solution 1–2000 or 1–5000. For exuberant granulations use the solid stick of nitrate of silver or the scissors.

GUMMATA.

During the stage of infiltration, before ulceration has commenced, "mixed treatment," or the iodide of potash, should be combined with local inunctions of 50 per cent. mercurial ointment. After ulceration has occurred incision may be necessary; but it must not be practiced too soon, as absorption sometimes takes place even at this late period.

GUMMATOUS ULCERS.

Gummatous ulcers should be thoroughly freed from all sloughs and débris, and dressed in the usual antiseptic manner, the patient being on strong constitutional treatment.

ALOPECIA.

Syphilitic alopecia requires both constitutional and local mercurial treatment. The head should be shampooed once or twice a week with soap and water, to which has been added a little borax. The hair is kept moderately short. Every night an ointment consisting of 30 grains of white precipitate to an ounce of cold cream should be well rubbed into the scalp. In the morning the ointment is washed off and a stimulating tonic applied to the scalp.

THE NAILS.

Affections of the nails require constitutional and local treatment.

In friable onychia the nails should be protected from injury and irritation, carefully pared and covered with mercurial ointment. It is well to soak the nails in hot bichloride solution 1–2000 twice daily.

In perionychia and separation of the nail from its matrix, mercurial ointment acts well, the parts having been previously cleansed with hot bichloride solution.

In ulcerative perionychia the granulations must be touched with the solid stick of nitrate of silver, and the surface dressed with iodoform, calomel and bismuth, mercurial ointment, or the wet bichloride of mercury

dressing; at the same time the affected parts should be kept very clean with hot bichloride solution.

MUCOUS PATCHES.

Mucous patches require constitutional as well as local treatment. When situated in the mouth, upon the lips, the internal surface of the cheeks, the tongue and the gums they should be touched every second or third day with the nitrate of silver stick or a solution of nitrate of silver (gr. xxx to ℥j).

Those situated upon the tonsils, the palate, the fauces, the pharynx and the larynx should be sprayed with a solution of nitrate of silver, from 15 to 30 grains to the ounce of water. The patient should wash the mouth several times daily with 1–1000 bichloride solution.

During the existence of these lesions the patient must not use alcohol or tobacco, and should keep the mouth and teeth scrupulously clean.

CONDYLOMATA.

Put the patient on anti-syphilitic treatment and keep the affected parts protected, clean and dry; wash them twice daily with one part Labarraque solution to eight parts of water or 1–1000 bichloride solution, or the Black or Yellow Wash, dry thoroughly, dust on calomel and separate them from opposing surfaces by bits of dry absorbent gauze.

LESIONS OF THE NOSE.

Secondary lesions of the mucous membrane of the nose yield nicely to mercurial treatment, while those involving the deeper structures require the addition of

potassium iodide. The parts must be cleaned by sprays, or douches, followed by the application of mild nitrate of silver solution and various astringent sprays. Local inunctions of mercurial ointment are also very beneficial.

LESIONS OF THE LARYNX AND TRACHEA.

Laryngeal syphilis requires constitutional as well as local treatment. For ulcerations, use a weak solution of nitrate of silver in the spray. If stricture follows the ulcerations, bougies may be resorted to, but are not of much avail. These patients must avoid alcohol and tobacco and the use of the vocal cords as much as possible.

The tracheal lesions are, as a rule, beyond the reach of local applications, so must be combated by constitutional treatment.

AFFECTIONS OF THE TESTICLE AND EPIDIDYMIS.

The testicles are held in a suspensory bandage, covered with 50 per cent. mercurial ointment, and the patient put on the "mixed treatment," or potassium iodide alone.

The effusion into the tunica vaginalis is generally absorbed under anti-syphilitic treatment; but if this does not occur after a reasonable length of time, the fluid should be drawn off with an aspirating needle.

LESIONS OF THE NERVOUS SYSTEM.

Syphilis of the nervous system, and especially those lesions which involve the brain and the spinal cord, require large doses of potassium iodide, or "mixed treatment," combined with local inunctions of 50 per

cent. mercurial ointment, given as near the seat of the supposed lesion as possible.

AFFECTIONS OF THE RECTUM.

The patient must have vigorous constitutional treatment, with dilatation, or, if necessary, division of the stricture. Local applications of mercurial ointment smeared on rectal bougies is an excellent method.

AFFECTIONS OF THE LACHRYMAL PASSAGES.

Iodide of potash and mercury should be given together, but besides this the majority of cases require local measures.

One or both canaliculi are incised as far as the caruncle, and dilated with a Bowman's probe; this procedure affords great relief by making a free communication between the sac and the conjunctiva, and also by giving an outlet to pus or any material that has formed in the sac. If there be an obstruction in the nasal passages due to œdema of the mucous membrane, a probe should be passed every few days and left in situ for several minutes, thus restoring the original calibre of the canal.

AFFECTIONS OF THE CONJUNCTIVA AND CORNEA.

Syphilitic affections of the conjunctiva and cornea require constitutional treatment. The eye must be protected from the light and the pupil kept dilated by means of atropine.

IRITIS.

The patient should be kept in a shaded but not darkened room, and go out morning and evening in the open air, with smoked or blue glasses.

In the acute form of iritis the patient must be brought under the influence of mercury as rapidly as possible, without causing impairment of the general health.

To prevent the formation of adhesions between the iris and the capsule of the lens, the pupil must be kept constantly dilated with a solution of sulphate of atropia (two grains to the ounce of distilled water), this being dropped in two or three times daily; it also relieves the pain and irritation. If the iris does not yield to the use of the atropia, leeches should be applied to the temple, or, these measures failing, evacuation of the contents of the anterior chamber by paracentesis corneæ must be resorted to. To relieve the pain mercurial inunctions may be made over the brow and temple; but if it be very severe, hypodermic injections of morphine are required.

For chronic iritis give mercury and potassium iodide, if well borne; but if not, tonics and potassium iodide internally and mercurial inunctions.

If, in spite of all treatment, the aqueous humor becomes very cloudy, the pain increases, the tension becomes greater, there is a decrease of vision, or if pus forms in the anterior chamber, then paracentesis should be performed; but if the disease still progresses, with an increase of all the above symptoms and extension of the inflammatory processes to the deeper structures of the eye, then iridectomy must be resorted to.

AFFECTIONS OF THE JOINTS.

The patient should be put on the "mixed treatment," or large doses of potassium iodide, and the joint or joints immobilized and covered with 50 per cent. mercurial ointment.

OSSEOUS AFFECTIONS.

Bone lesions require large doses of potassium iodide, or the "mixed treatment," combined with local rubbings of 50 per cent. mercurial ointment. In case of necrosis or pus formation we resort to the regular surgical treatment for these conditions.

DACTYLITIS.

The affected parts should be covered with mercurial ointment and the joint immobilized if indicated. The patient is put on full doses of the "mixed treatment" or potassium iodide alone. If the tension is very great it must be relieved by a free incision over the most prominent part of the swelling, but this should not be done too early, or unless absolutely necessary.

CHAPTER XL.

CONSTITUTIONAL TREATMENT OF SYPHILIS.

The constitutional treatment of syphilis consists in the use of the specific remedy mercury, administered alone during the early manifestations and combined with the iodide of potassium or sodium in the later ones.

At the same time the patient's general condition must be carefully watched and regulated by the employment of proper hygienic measures and tonics.

Hygiene. The patient should lead a moderate, regular life, with nourishing and readily digestible diet. A little ale or beer can be taken at lunch and a glass or so of claret or burgundy with dinner; champagne is harmful, as is also whisky, brandy or spirits, and should, therefore, not be allowed. Tobacco in all forms must be interdicted, especially when there are lesions of the mouth, the tongue, the fauces, etc., as it causes local irritation of these parts, as well as a depressing influence on the system generally. There should be at least one good evacuation of the bowels every day. Moderate exercise in the fresh air must be insisted upon, as well as bathing in either hot or cold water, which ever is preferable; as by these means the secretory apparatus of the skin is kept in good working order.

In the primary stage—that is, before the disease becomes constitutional, the patient's general health must be investigated and he or she put in as good physical and mental condition as possible. The teeth and gums

should be examined, and put in thorough order, as rough and decayed teeth and spongy gums cause local irritation, which is the prime factor in the production and persistence of mucous patches.

Tonics. To combat the anæmia which occurs in the primary and the early part of the secondary stage tonics must be administered, such as quinine, iron, strychnine, gentian, or the fluid extract of erythroxylon cocoa, which latter preparation has a decided tonic effect on the heart and nervous system generally.

ADMINISTRATION OF MERCURY.

The use of mercury in the primary stage of syphilis, as a rule, does no good, but tends to render the development of the manifestations irregular, and very often makes the diagnosis as to whether the patient has had syphilis or not very doubtful. As a broad general rule, therefore, with certain rare exceptions, patients should not be put upon constitutional mercurial treatment until the disease is constitutional, which is shown by the appearance of the roseola or macular syphilide.

In using mercury it must not be forgotten that in certain instances it is very apt to cause such disagreeable complications as ptyalism and stomatitis, gastro-intestinal disorders, impairment of nutrition, and depression of the vital forces, but fortunately such complications at the present time are rare, as the doses employed are small, the preparations more carefully selected, and the gums and teeth put in good order in the primary stage of the disease, before constitutional treatment is commenced.

Mercury may be administered by the mouth, by inunction, by hypodermic injection, and by fumigation.

BY THE MOUTH.

If the drug is to be administered in this manner, the best preparations are the protoiodide (green iodide), or the tannate of mercury, given in the following manner:

℞.	Hydrarg. protoiodid.,	gr. viij–x.
	Ferri et quin. cit.,	ʒjss.
	Ext. hyoscyam.,	gr. vj. M.
Ft. in pil. No. xxx.		
S.	One pill three times a day.	

℞.	Hydrarg. tannic.,	gr. xv–xxx.
	Quin. sulph.,	ʒj.
	Ext. hyoscyam.,	gr. vj. M.
Ft. in pil. No. xxx.		
S.	One pill three times a day.	

If so desired, the salicylate, or the thymoloacetate of mercury may also be used in pill form, in half-grain doses; practically however, they have no advantage, nor are they even as efficient as the tannate or protoiodide.

If the pills cause colicky pains and diarrhœa they may be stopped for a day or so, and the patient given a little ginger or paregoric; when they are resumed it is best to begin with one pill daily, and increase the number cautiously. It must be remembered that the pill treatment is more liable to cause salivation and gastro-enteritis than the inunctions, to which it is far inferior as regards the ultimate cure of the patient.

This treatment can be continued for the first few

weeks of the disease, when it must be stopped, and the patient put on inunctions of mercurial ointment, which are continued up to the end of the first year. In the majority of cases at the end of the first six months the patient is doing so nicely, and the disease is so thoroughly under control, that medication may be suspended temporarily for two to four weeks, and then resumed.

At this period the lesions, if any exist, and this is rarely the case, are mild, and consist of patches on the tongues of drinkers and smokers, and persons who have not kept these parts clean, or superficial lesions in those who are subject to simple skin affections.

The next course of treatment generally lasts from two to three months, when the drug may be again discontinued for a time, and then resumed, until the end of the first year, during which the patient has had about nine to ten months of actual treatment.

INUNCTION.

This is the most efficacious mode of administering mercury and for the purpose we employ 50 per cent. fresh mercurial ointment made with lard.

The part to be rubbed should be thoroughly cleansed with soap and hot water, dried, and sponged with alcohol. A fresh portion of integument is selected each time, and rendered clean as above described, as in this manner irritation of the integument is in a great measure prevented.

For each inunction, which should occupy about thirty minutes, are used from twenty-five to seventy-five grains of the ointment, which is carefully weighed and put up in oiled papers or gelatin capsules. The average

healthy man takes about sixty grains at a rubbing, although there are some who go as high as seventy-five and even eighty grains.

A course of inunctions consists of eleven rubbings, given on the following regions, into which the body is divided (Taylor):

Region 1. The entire neck, well up to face and hair line, and down to clavicles.

Region 2. The right shoulder, axilla, arm, forearm and hand (dorsum and palm).

Region 3. The left shoulder, axilla, arm, forearm and hand (dorsum and palm).

Region 4. Right half of chest and abdomen, (from clavicle to groin, and from median line to axillary line).

Region 5. Left half of chest, and abdomen, (from clavicle to groin, and from median line to axillary line).

Region 6. Right half of back, (from root of neck to buttock, and from median line to axillary line).

Region 7. Left half of back, (from root of neck to buttock, and from median line to axillary line).

Region 8. Right thigh and groin.

Region 9. Left thigh and groin.

Region 10. Right leg and foot, (dorsum and plantar surface).

Region 11. Left leg and foot, (dorsum and plantar surface).

For rubbing hairy parts, such as the head, beard, etc., we substitute thirty grains of white precipitate to an ounce of vaselin, for the mercurial ointment, the part having been previously washed.

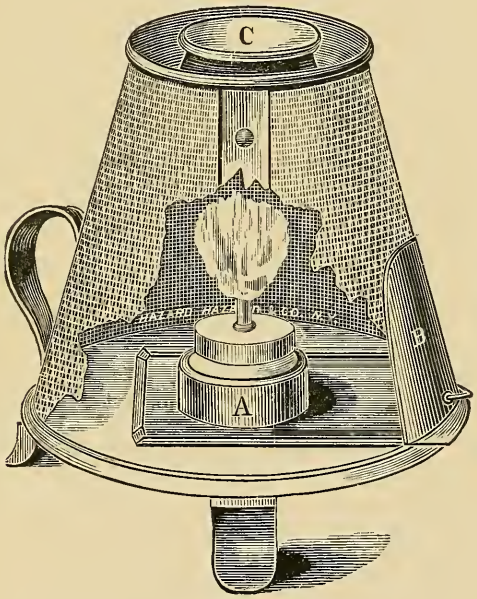
As a rule, the rubbings are given every other night, the first one not being washed off until just before the

second one is administered, and so on through the entire course. When one course is finished, treatment should be stopped for a few days and then resumed.

FUMIGATION.

Fumigations are of great value in the chronic, the localized, the scaling and ulcerating eruptions of syphilis.

FIG. 53.



Lee's lamp.

The mercurial vapor is best generated from calomel and cinnabar placed on a Lee's lamp. (See Fig. 53.)

The purest calomel and cinnabar (red sulphide of mercury) must be employed, and the body thoroughly washed before the bath is given. The bath should be taken at night just before retiring, and about twenty grains of calomel and forty grains of cinnabar used; these are mixed and placed on the lamp.

The patient sits undressed and covered with blankets on a cane-bottom chair, beneath which is the lamp; in a few minutes profuse perspiration comes on, the drugs being completely evaporated in twenty minutes; the lamp is then extinguished; the patient remains on the chair a few minutes longer, and then retires in the same blanket, without being rubbed.

The bath may be given every night, or one to three times weekly, according to the strength of the patient and the amount of mercurial effect desired. The patient should wear flannel underclothes, follow the hygienic rules already laid down, and be very careful not to catch cold.

HYPODERMIC INJECTIONS.

The treatment of syphilis by hypodermic injections is very useful, and may be regarded as a valuable addition to the above-described methods; it is also serviceable in cases in which we require the speedy action of the drug, and when mercury cannot be taken by the mouth or rubbed into the skin.

Its general adoption as a routine method of treatment cannot be recommended, as the injections are followed by pain, soreness, indurated nodules, and in some cases by abscess.

The best preparation is a watery solution of the bi-

chloride of mercury, used in several strengths; varying from $\frac{1}{12}$ to $\frac{1}{2}$ of a grain of the drug in ten or twelve drops of distilled water; $\frac{1}{8}$ of a grain being a good average dose.

Calomel may also be employed for this purpose, giving from $\frac{1}{4}$ to 1 grain in ten drops of distilled water.

The injections are given with a hard-rubber syringe (holding twelve drops), and steel needles about an inch and a quarter long, every antiseptic precaution being taken as regards instruments and the preparation of the integument.

The best places for making the injections are the gluteal regions. It is better to wait a day or so after each injection before giving another, in order to test the susceptibility of the patient.

This method gives good results in cephalalgias, in the early eruptions, and in cases in which mercury is not well borne by the stomach.

In ocular troubles the injections are of great benefit, as is also the case in osseous, bursal, fascial and articular lesions, especially the early ones, at the same time giving potassium iodide in full doses.

At the beginning of the second year mercurial treatment alone is stopped, and the patient put on the "mixed treatment," which is continued in the same manner (like the first year's treatment) for from one and a-half to two years, according to the progress of the case; the patient getting about eight to ten months' actual treatment during the second year. The following prescription for the "mixed treatment" is a good working formula, but may have to be somewhat modified according to the susceptibility of the patient.

℞. Hydrarg. binioidid., gr. j–ij–iij.
Potas. iodid., ʒij–ʒj.
Tinct. gen. co., ʒiij.
Aq., ad ʒiv. M.

S. One teaspoonful in water one to two hours after each meal.

In the above formula we can substitute for the tincture of gentian, if so desired, the compound tincture of cinchona, or the essence of pepsin.

IODIDE OF POTASH.

Iodide of potash has a very decided effect upon the lesions of the transition and tertiary stage; but as it subdues rather than cures them it is best to combine it with mercury, either internally or in the form of inunctions.

The dose of the iodide in the beginning should be five to fifteen grains, three times a day, an hour after meals; but this may have to be increased to one, two or even three hundred grains daily. It is best to begin with very small doses, given in Vichy water and lemon-juice, milk, or essence of pepsin.

In some instances it causes coryza, pain in the frontal sinuses, œdema of the conjunctiva, swelling of the lids, irritation of the fauces, gastro-intestinal derangements, eruptions on the skin, most commonly papules, acne pustules, or furuncles, and which, as a rule, are situated upon the face and the neck. All the above complications rapidly subside on the temporary suspension of the drug.

In large and long-continued doses iodide of potassium gives rise to a condition known as iodism, which con-

sists of a feeling of oppression in the head, tinnitus aurium, neuralgia, spasmodic muscular action, impairment of voluntary motion and sluggish intellect.

SALIVATION.

During a course of mercurial treatment some subjects are liable to become salivated, especially those with bad teeth and spongy gums, which conditions should have been corrected in the primary stage. The first symptom is soreness of the gums just behind the superior incisors, and in the lower jaw back of the last molars; the other symptoms of mercurial stomatitis are a metallic taste in the mouth, fetid breath, increased flow of the saliva, tenderness of the teeth when closed upon each other, swelling of the tongue, which is marked by the teeth on its sides, œdema of the mucous membrane of the cheeks, gums and lips, with difficulty in articulation and deglutition. The neighboring lymphatic glands may become enlarged. Sometimes there is fever, accompanied by general malaise. In rare and extreme cases there is ulceration of the soft parts, which may or may not be followed by necrosis of the maxillary bones.

Treatment. The mercury must be stopped immediately, the bowels kept freely open with saline cathartics, and the patient given a hot bath and put on a liquid and nourishing diet. For a gargle and mouth-wash use a solution of chlorate of potash (two drachms to a pint of water), which must be employed frequently. The line of juncture of the teeth and gums may be painted with equal parts of tincture of iodine and tincture of myrrh. If the flow of saliva is very profuse, small doses of sulphate of atropia should be given. A

mouth-wash consisting of a drachm of alum to a pint of water is very serviceable in some cases, as is also 1 : 1000 bichloride solution in cases where the teeth and gums have not been kept clean.

DURATION OF TREATMENT.

Specific treatment should be continued as long as any syphilitic manifestations remain, and for at least two, to two and a-half, or three years, even in those cases that have had no symptoms since the general outbreak.

After a proper course of medication the majority of cases are cured ; but it must not be forgotten that this is not always the case, and that the late manifestations are the most dangerous, especially the lesions of the brain and the arteries.

CHAPTER XLI.

HEREDITARY SYPHILIS.

Hereditary syphilis, also incorrectly known as congenital and infantile syphilis, is that variety in which the disease is transmitted to the fœtus in utero from either one or both parents.

As a rule, symptoms appear about the third week of life, but sometimes occur at birth, or as late as the third month, and in some instances even later.

If both parents are syphilitic the fœtus generally dies, or the child manifests symptoms at a very early date.

The severity of the disease decreases with each succeeding child, and as a rule is only transmitted to the second generation, unless very severe, when it may be transmitted to the third.

There is no initial lesion nor are there any regular stages in hereditary syphilis; the lesions are more hyperæmic and active than in the acquired form, and attack every organ and tissue.

Hereditary syphilis may be derived from either one or both parents. If procreation occur while the father is in the first period of incubation the child will escape infection, and may do so even if he be in the second period of incubation, but is usually infected if he has secondary manifestations, although mercurial treatment may so modify the disease in the father that the child will escape, even during the first year. The father

transmits his disease through his sperm cells, which come in direct contact with the ovule of the female at the time of fecundation. A syphilitic father can transmit his disease to the fœtus, the mother escaping infection.

The mother may also transmit syphilis to the fœtus, but her disease must be constitutional, as at that time her ovule is syphilitic, and the fœtus is thus infected at the time of fecundation. The disease of the mother may be so modified by mercurial treatment that the child will escape infection. The syphilis of the mother acquired during pregnancy may be conveyed to the fœtus through the utero-placental circulation, and the mother may also be infected by a syphilitic fœtus through the utero-placental circulation, provided that in both cases the structure of the placenta is altered or impaired, thus interfering with its normal function of filtration.

Syphilitic women are very liable to abort, and generally do so between the fifth and seventh months.

The severity of the disease in the child is in proportion to its intensity in either one or both parents at the time of its conception.

The course of the disease is chronic and very irregular. Superficial and visceral lesions may be present at the same time.

The duration of hereditary syphilis depends upon the intensity of the disease and the treatment employed. Some children are healthy at the end of a few months, others in a year, and others not until the tenth or twelfth years.

The mortality of syphilitic children is very great-

about one third perishing before maturity. Abortion caused by the death of the fœtus takes place at about the sixth month. The fœtus is usually macerated, of a purple color, with various visceral lesions and bullæ upon the soles and palms.

Syphilitic stillborn children, or those dying soon after birth, frequently have no cutaneous lesions.

The majority of syphilitic children born alive look perfectly healthy, but at about the end of the third week the disease manifests itself.

CHAPTER XLII.

LESIONS OF HEREDITARY SYPHILIS.

The principal eruptions of hereditary syphilis are the erythematous, the papular, the vesicular, the pustular, the bullous and the tubercular syphilides.

THE ERYTHEMATOUS SYPHILIDE.

The erythematous syphilide, or roseola, is the first eruption, and appears about the third week of life; it may be preceded by or accompanied with coryza. Beginning upon the lower portion of the abdomen as pink spots, the eruption finally invades the trunk, the face and the extremities; the spots gradually assume a dull-red, coppery color, which does not disappear on pressure, owing to the pigmentation of the skin. As a rule, there is no elevation or desquamation of the spots, except in severe cases, or when they are situated upon the palms, the soles or the nates. In some instances the spots coalesce, forming fissures which may or may not be painful. The eruption may be so faint in some cases as to escape observation.

THE PAPULAR SYPHILIDE.

This syphilide is sometimes the first to appear, or may be intermingled with the erythematous eruption. The lesion consists of large and small flat papules, scattered over the body. Grouping is infrequent except at a late period, and is then seen about the joints

and on the extremities. The papules are coppery-red in color, and may exfoliate, especially when situated upon the palms or soles.

CONDYLOMATA LATA.

Condylomata lata are really nothing more than modified papules, which, being situated between opposed surfaces of skin, at muco-cutaneous junctures. or wherever there is moisture, become hypertrophic. They vary in size and shape, are of a grayish-pink or brown color; the surface is flat, sometimes fissured and ulcerated, with an offensive secretion; they appear early, run a chronic course, and are most frequently encountered about the anus. With proper treatment they disappear, leaving copper-colored pigmentations, which finally fade.

THE VESICULAR SYPHILIDE.

This syphilide is rare and occurs as an early manifestation. It appears in groups, situated upon the chin, about the mouth, upon the forearms, the nates, the hypogastrium and the thighs, and is usually associated with a bullous or pustular eruption.

The vesicles may be large or small, are situated upon an infiltrated base of a brownish-red color and contain serum or sero-purulent fluid.

It is readily influenced by treatment and does not tend to relapse.

THE PUSTULAR SYPHILIDE.

This syphilide generally appears before the eighth week; it may involve the entire body, but it is usually most marked upon the thighs, the buttocks and the face.

The pustules vary in size and are situated on a thickened, deep-red base; they sometimes rupture, leaving an ulcerated surface, which may or may not become incrusted.

Those about the mouth have a tendency to coalesce. Groups of pustules are liable to form in the palms or soles, or develop around the nails, and finally destroy them. If the scalp is invaded by the eruption there is usually some resulting alopecia.

FURUNCULAR ERUPTIONS.

Furuncles are liable to appear as early as the sixth month, or as late as the third year, and may either be alone or associated with other lesions.

They form slowly and without any signs of inflammation, the base being of a coppery-red color. Superficial ulceration occurs on the apex, leaving a deep ulcer, with everted margins, and a scanty, offensive secretion. These ulcers remain from one to several months, frequently leaving permanent cicatrices.

THE BULLOUS SYPHILIDE.

The bullous syphilide, or pemphigus, always indicates a severe and often fatal form of hereditary syphilis; it may occur at birth, or from a month to six weeks afterward.

The palms and soles are most frequently invaded, although any portion of the body may be attacked.

The bullæ are conical, rounded or flattened, and contain sero-purulent fluid, which soon becomes purulent; the surrounding skin is thickened and of a cop-

per color. After rupturing, their course is chronic like that of the pustules. Relapses are very rare.

THE TUBERCULAR SYPHILIDE.

This eruption may occur as early as the sixth month, or even several years after birth.

It begins as deep-seated nodules or papules; these implicate the integument, forming sharply circumscribed tumors, which either disappear or break down into chronic ulcers. The surface of the tubercles may be scaly, looking somewhat like psoriasis. They are usually found where the connective tissue is loose and abundant.

GUMMATA, AND GUMMATOUS ULCERS.

These manifestations of the disease usually occur between the third and the twentieth years. Their course is similar to those in the acquired form.

THE MUCOUS MEMBRANES.

One of the first symptoms of hereditary syphilis is snuffling, accompanied by a profuse or scanty serous discharge from the nostrils, which is due to a structural change in the nasal mucous membrane.

The secretion becomes purulent, bloody and offensive, causing œdema and excoriation of the nose and the upper lip, upon which crusts may form.

The lesion begins as a simple erythema of the mucous membrane, ulceration ensues, and the disease may then extend to the bony and cartilaginous framework of the nose, causing its destruction, with more or less resulting deformity.

MUCOUS PATCHES.

These lesions are at first whitish in color, elevated, and surrounded by an erythematous border; the epithelium is soon removed, leaving a slightly depressed, red surface, which may or may not undergo ulceration.

They are most commonly situated at the angles of the mouth, upon the mucous membrane of the cheeks, the fauces, the tonsils, the sides and dorsum of the tongue, and on the gums, near the teeth.

The secretion from the patches is free, serous in character and highly contagious, so that great care must be exercised to guard against the infection of others, especially healthy wet nurses, who would naturally be infected on the nipple or breast by nursing such children, although the mothers of these children acquire an immunity to syphilitic infection, or as Colles says: "I have never witnessed nor heard of an instance in which a child deriving the infection of syphilis from its parents has caused an ulceration on the breast of its mother." This statement is known as Colles' law.

Mucous patches are very prone to relapse, and this is sometimes observed even as late as the sixth year.

GUMMATOUS INFILTRATIONS.

These lesions generally occur between the third and the twelfth years.

They consist of a cellular infiltration of the mucous membrane, which at first becomes reddened and elevated, and finally develops into well-marked tumors, which usually break down into undermined ulcers, with a greenish, thick secretion.

Their favorite sites are the hard palate and the posterior pharyngeal wall.

The cause of these lesions is chronic.

THE LARYNX.

During the early years of syphilis the larynx may be the seat of simple hyperæmia, of mucous patches, or of ulceration, which involves either the mucous membrane alone or the cartilage beneath it.

Gummatous infiltrations of the larynx belong to the later stages, and require full doses of the iodide of potash.

THE LUNGS.

Upon the surface of the lung, and scattered through its substance on the smaller vessels and bronchi, are numerous nodules, differing in size, and varying in color from a grayish-pink to a light yellow; the pleura near these nodules becomes opaque and thickened.

An entire lung, or only portions of a lobe, may be involved.

The morbid process begins by congestion, followed by cell-proliferation around the bronchioles and in the walls of the capillaries, causing partial or complete occlusion of their lumen, and destruction of the function of the lung. The nodules consist of connective-tissue cells, of fibrous and of gummatous tissue, and may undergo fatty or caseous degeneration.

True gummatous nodules do sometimes occur.

These lesions are most frequently encountered within the first eighteen months of life.

THE ALIMENTARY CANAL.

It is thought by some observers that the chronic diarrhœa met with in syphilitic children is due to an erythema of the gastro-intestinal mucous membrane, similar to the erythema occurring in the mouth and pharynx.

THE LIVER.

The liver may be the seat of a connective-tissue infiltration, which renders it hard, globular and hypertrophied; these changes are either circumscribed or general.

This new indurated tissue causes the capillaries to become obliterated, and the calibre of the larger vessels to be diminished, and also compression of the cells of the acini, with the cessation of the flow of bile.

Gummatous hepatitis occurs either as numerous small tumors, scattered through the substance of the liver, or as one or more isolated tumors.

THE SPLEEN.

During the early stages of the disease the spleen may become more or less hypertrophied, but yields readily to mercurial treatment.

The enlargement is very great, rapid in its course, and most marked in cachectic children, and those in whom the disease is of a severe type.

THE PANCREAS.

The organ may be enlarged and firm in consistence. The interstitial connective tissues is increased, especially

between the larger lobules, causing compression of them, with atrophy, and fatty degeneration of their epithelium.

THE KIDNEYS.

The lesion consists of a diffuse or circumscribed infiltration of round embryonic cells, with others of fusiform shape, into the connective-tissue framework, followed by compression or destruction of the tubules and colloid degeneration of their epithelium; the organs are at first enlarged, but gradually become greatly reduced in size.

The suprarenal capsules sometimes become enlarged, owing to the proliferation of young connective-tissue cells.

THE TESTICLES.

When these organs are affected the disease consists of a chronic, painless enlargement of one or both testes, generally accompanied by hydrocele and hyperæmia of the scrotum. The epididymis and cord are sometimes involved.

The lesion consists of a connective-tissue proliferation, either interstitial or diffuse.

If commenced at an early date, mercurial treatment causes speedy resolution; but if neglected, atrophy or degeneration with abscess-formation, followed by fungous protrusion of the testicle, may occur.

In all probability the ovaries are effected in a similar manner.

THE SHEATHS OF THE TENDONS.

The sheaths of the tendons may become swollen and filled with fluid, the overlying skin being distended and reddened. This affection comes on rapidly, is not

readily influenced by anti-syphilitic treatment, and runs a chronic course.

THE NAILS.

Affections of the nails are not so common in hereditary as in acquired syphilis.

There are two forms of onychia; the ulcerative and the non-ulcerative.

Ulcerative onychia usually occurs during the first and second years of the disease, but may appear much later.

It is the most common form, and begins at the side or base of the nail as a papule or pustule, which ulcerates and extends along the base or margins of the nail, and finally involves the matrix, which results in the loss of the nail, thus leaving an unhealthy-looking ulcer, with sanious discharge. The terminal phalanx becomes red, enlarged and painful.

The nails of the fingers are more liable to be attacked than those of the toes.

Cicatrization of the ulcer, without the formation of a new nail, sometimes follows, or a deformed and useless one may grow.

The course of this affection is chronic, unless shortened by mercurial treatment.

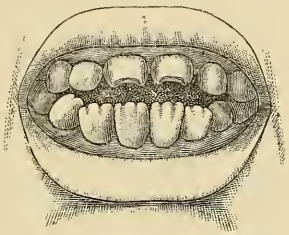
Non-ulcerative onychia is a later and more chronic manifestation.

It commences as a coppery-colored swelling at the margin or base of the nail, which soon becomes thickened, fissured and brittle, dirty-white in color, with hyperæmia of the matrix and adjoining tissues. There is usually some deformity of the phalanx which may or may not be permanent.

THE TEETH.

The permanent teeth in hereditary syphilis present certain peculiarities, especially the upper central incisors of the second set, which are known as Hutchinson's teeth, or test-teeth. (See Fig. 54.)

FIG. 54.



Hutchinson's teeth.

In describing these teeth Mr. Hutchinson says: "As diagnostic of hereditary syphilis, various peculiarities are often presented by the other teeth, especially the canines, but the upper central incisors are the test-teeth. When first cut these teeth are usually short, narrow from side to side at their edges, and very thin. After a while a crescentic portion from their edges breaks away, leaving a broad, shallow, vertical notch, which is permanent for some years, but between twenty and thirty usually becomes obliterated by the premature wearing down of the tooth. The two teeth often converge and sometimes they stand widely apart. In certain instances in which the notching is either wholly absent or but slightly marked, there is still a peculiar color ('a dirty-brownish hue resembling that of bad

size '), and a narrow squareness of form, which are easily recognized by the practised eye."

The first or temporary set of teeth do not show this malformation and many children suffering from hereditary syphilis have perfectly normal teeth.

THE HAIR.

Affections of the hair in hereditary syphilis are very like those in the acquired form. They occur with lesions of the scalp, especially the pustular syphilide.

THE LYMPHATIC GLANDS.

In hereditary syphilis there is no general subacute adenitis, as in the acquired form, although groups of glands may be enlarged if they are in relation with active lesions.

THE BONES.

Osteochondritis. This affection occurs either in the first months of the disease or as late as the twelfth year, and is a very constant manifestation of hereditary syphilis.

It most commonly attacks the bones of the forearm, the leg, the arm, and the thigh, but the clavicle, the sternum, the ribs, the metacarpal and the metatarsal bones may also be involved.

The lesion is situated at the diaphyso-epiphyseal junction, and consists of a ring-shaped swelling around the end of the bone. In some cases the entire epiphysis may be enlarged, with or without the ring-formation at its junction with the shaft. If two bones are affected, as those of the forearm or the leg, they appear to be

fused together by this process. The distal ends of the bones are more frequently attacked than the proximal.

The lesion develops slowly in some cases, and rapidly in others; causes but little pain, interferes only slightly with motion, and disappears under proper treatment. The integument is not involved unless the mass be very large, when it is rendered tense and painful. The joints may be secondarily invaded, especially the elbow- and knee-joint.

In some cases the lesions degenerate and break down, causing ulcerations of the integument; the epiphysis may be separated from the shaft and destroyed, likewise the cartilage. In other cases resolution of the swellings occurs, and the bone returns to its normal condition; but if the intermediate layer of cartilage be destroyed, the bone is usually shortened.

Periostitis is a later affection, and usually appears between the fourth and nineteenth years.

Any of the long bones may be affected, and in some cases those of the skull also. The bone becomes tender, enlarged, and curved anteriorly; the process may involve the entire length of the shaft, or be localized and produce nodes. One or both limbs can be thus affected.

Dactylitis. The lesions are the same as in the acquired form of syphilis, and consist of swelling of the phalanges, the metacarpal and the metatarsal bones in the early months of the disease, or even as late as the twentieth year.

The proximal phalanges are more often attacked than the distal ones. The course of this affection is chronic, unless treated, when it responds nicely.

THE JOINTS.

In some cases of osteochondritis there is a serous effusion into the neighboring joint, which becomes slightly painful on account of the tension; resorption and complete recovery usually ensue. The elbow, the wrist, the shoulder, the knee, and the ankle are most frequently involved, although almost any articulation is liable to invasion.

In the latter years of syphilis the larger joints may be affected either primarily or secondarily to lesions of the bones. The process is slow, the joint being greatly distended and slightly painful; the surrounding skin remains normal. With the proper treatment resolution generally takes place, leaving a good articulation.

THE EYES.

In hereditary syphilis the eyelids and the eye itself are liable to all the lesions which occur in the acquired form, and which have already been described under that heading. These affections appear at a very early date.

THE EARS.

The occurrence of sudden deafness in children who have hereditary syphilis is quite common. It is apparently due to disease of the nerves, or of their distributions in the labyrinth. The changes in the external parts, or the membrana tympani, are not sufficient to account for it; the Eustachian tubes also remain normal.

This affection is usually observed from about five

years before puberty to the same length of time after it. The prognosis is unfavorable.

THE NERVOUS SYSTEM.

In hereditary syphilis inflammation of the meninges and endoarteritis have been observed; also gummata upon the membranes.

Chorea sometimes occurs, and is either mild or severe in character; it may be accompanied by hemiplegia or epilepsy. In these cases it is thought that the hemiplegia is caused by plugging of the middle cerebral artery; that the chorea is due to occlusion of its small distal branches, and that the epilepsy is occasioned by thickening of the meninges or gummata in or near the corpus striatum.

Epilepsy may occur alone, and has been observed as late as the fifteenth year.

There is sometimes paralysis of the cranial nerves.

In their evolution and course the affections of the nervous system in hereditary syphilis resemble those in the acquired form of the disease.

HEMORRHAGIC SYPHILIS IN NEWBORN CHILDREN.

This condition exists at birth, or not later than the first month of life, and is frequently the only manifestation of the disease, but may be accompanied by other lesions.

In some cases there is a small, subcutaneous hemorrhage in parts exposed to friction or pressure, while in other cases it occurs in or upon mucous membranes and viscera, or from the umbilical vein, and may be profuse or even fatal.

PROGNOSIS OF HEREDITARY SYPHILIS.

The prognosis of hereditary syphilis is always unfavorable, and depends greatly upon the condition of the parent or parents at the time of conception, the intensity of the lesions in the child, and whether the parents have received proper anti-syphilitic treatment for a sufficient length of time.

CHAPTER XLIII.

TREATMENT OF HEREDITARY SYPHILIS.

If a pregnant woman be syphilitic, she should be put immediately on inunctions of mercurial ointment, which must be continued in a careful and methodical manner during her entire pregnancy. These women may also be treated by hypodermic injections of bichloride of mercury, or the "mixed treatment" internally, but the two latter methods of medication should be regarded as adjuvants rather than routine treatment, and to be employed only when inunctions cannot be taken.

The mother's genitals must be kept in a healthy, clean condition, or if lesions exist upon or around them, they should receive active and appropriate local treatment.

If the father was syphilitic at the time of impregnation or showed any manifestation of syphilis before it, then the mother must have anti-syphilitic treatment in the manner above described for its beneficial effect on the fœtus.

In treating syphilitic infants great care must be used, as internal medication is liable to set up gastro-intestinal irritation, and inunctions are sometimes precluded on account of the delicacy of the skin.

Treatment of the child by means of the milk of the mother or nurse is known as indirect treatment, and although authors differ as to its utility, it is unquestionably of great value in certain selected cases, and

should, therefore, be employed in these cases; the nursing-woman taking the "mixed treatment," or the iodide of potash alone, both of which drugs medicate the child through the milk of the nurse or mother.

The direct treatment of the child should be intermittent and not continuous in character; during the intervals of treatment it is well to administer tonics, and to do all in our power to build up the general condition.

During the first year it is best to employ internal treatment, but after that time the inunctions of 50 per cent. mercurial ointment will be found very serviceable.

By the mouth may be given calomel in doses of from $\frac{1}{8}$ to $\frac{1}{2}$ a grain three times a day, according to the age and strength of the patient; this can be mixed with a little sugar of milk. Gray powder in doses of $\frac{1}{8}$ to $\frac{1}{3}$ of a grain three times daily causes less gastro-intestinal irritation than calomel, but is not so uniform in its effects.

The protoiodide (green iodide) or the tannate of mercury in doses of $\frac{1}{20}$ of a grain may be given three times a day, mixed with sugar of milk or subnitrate of bismuth, and suspended in a little water; one-grain doses of the lactate of iron may be combined with the mercury, and in some cases acts very nicely as a tonic.

For inunctions we employ 50 per cent. mercurial ointment, using from 15 to 30 grains every day, or every other day, according to the age and condition of the child.

Lesions of the bones, the joints, the nervous system, and the viscera require a combination of the biniodide of mercury and the iodide of potash, beginning with small doses well diluted in water.

If the syphilides are very persistent, much benefit is derived from their local treatment by fumigations, ointments, lotions, or baths containing mercury; at the same time they must be kept scrupulously clean.

DURATION OF TREATMENT.

Constitutional treatment should be employed for at least two years, and continued for several months after all manifestations of the disease have disappeared.

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